Republic of Rwanda
Ministry of Health

Rwanda Biomedical Centre
Healthy People, Wealthy Nation

National Tuberculosis and other respiratory communicable Diseases Program

Annual Report

2020-2021

FOREWORD

The Ministry of Health would like to express its deep appreciation and sincere thanks to all who contributed to the production of this annual report of Tuberculosis and other respiratory communicable diseases control in Rwanda.

This report has been developed based on data collected by the TB and ORD surveillance system in Rwanda. This annual report depictures the status of activities conducted and achievements in the fight against TB and leprosy diseases based on the 2019-2024 Rwanda TB National Strategic Plan and Rwanda Leprosy National Strategic Plan.

Elimination of Tuberculosis and leprosy in Rwanda will require strengthened, integrated and digitalized health services. This will ensure consistent, evidence-based prevention, treatment and support to patients and their families.

Covid-19 pandemic had an impact on our TB services, as we experienced a decrease in TB notification when comparing the periods before and during Covid-19.

This report represents a collaborative effort between the Government of Rwanda and its partners. Representatives from all Stakeholders involved in the national TB response, the civil society, local and international non-Governmental, bilateral organizations as well as Rwandan Government institutions, participated in the production of this report. We remain entirely grateful to the inputs and support from each and every one.

I gratefully acknowledge all those who contributed on the frontline, at health facilities, for their commitment and involvement to implement strategies adopted by the Government of Rwanda through Ministry of Health to fight TB and Leprosy.

Achieving these goals will require sustained commitment to fund and implement these intensive efforts needed to reach the 2025 milestones set by End TB and Leprosy strategies.

Dr. NGAMIJE M. Daniel
Minister of Health

EXECUTIVE SUMMARY

TB screening and diagnosis

During 2020-2021 FY, TB case detection and monitoring of TB activities at decentralized level were challenged due the covid-19 pandemic where the country experienced two different waves of transmission leading to control measures including restriction of people movement as total or partial lockdown. Despite all this, the country has been able to ensure continuity of service mainly based on the strengthening of community health workers and the digitization of certain services such as the implementation of an individual case-based surveillance system which allowed to provide support remotely.

Early accurate diagnosis followed by prompt appropriate treatment is vital for ending TB. Rwanda adopted actives cases finding of TB among people at high risk to develop TB and use of chest x-ray as screening tools.

During this 2020-2021 FY, 176,636 TB presumptive were identified versus 140,860 in the previous FY representing an increase of 25%. Sixty four percent (63.6%) of presumptive were referred by Community health workers compared to 43.4% in 2019-2020 FY. This increase was due to bidirectional screening during covid-19 pandemic and enforcement of community detection during lockdown. Using chest x-ray as triage tools, 14917 people among prisoners (9971), youth at transit center (3712) and PLHIV (1234) were screened and 14,8% had abnormal Chest x-ray suggestive TB and were TB presumptive.

Covid-19 pandemic has negatively affected different sectors of the country life including health services. Comparison of TB notification before (January-June 2019) and during the Covid-19 period showed a 7% decrease in January-June 2020 period and a 10% decrease during January-June 2021.

The total number of all TB cases diagnosed was 5,435 including 28 RR/MDR-TB cases. Among them children under 15 years represented 6.3% (346), male represented 72,1% and 26.3% were referred by CHWs. Eighty three percent (83.5%) had pulmonary TB, 99% (5382) were new and relapse, 75.6% were bacteriologically conformed TB of which 73.7% were detected using GeneXpert test. The proportion of HRG was 53.4% compared to 50.4% in 2019-2020 FY. 89.1% of bacteriologically confirmed TB have their drug susceptibility test and 72.9% of newly TB cases were diagnosed using molecular test for initial diagnostic. TB treatment was initiated to 98% of notified TB cases.

Rwanda National TB reference laboratory was designated by WHO as Supra Reference laboratory candidate to support Madagascar and Comoros. To ensure quality of diagnostic at laboratory, external quality control assurance was conducted in 79% of Center for Diagnostic and Treatment (CDT) at least 3 times per years; 8933 smears microscopy were reviewed, and 7 slides were high false negative, and 6 CDTs had major errors. Proficiency panel of GeneXpert received

from CDC Atlanta were provided to 42 out 64 experts sites and 38 sites passed the score of 85% and more.

TB management and treatment outcomes

The national TB technical working team for management of TB commodities conducted stock monitoring to ensure the availability of TB medicines and diagnostic commodities in all health facilities.

The treatment success rate for susceptible TB(DS) 88.2% and 95.2% drug resistant (DR) TB patients. The overall success rate for DS&DR was 88% compared to 86.7% for the previous FY. We observed an increase of treatment success rate from 88% last FY to 90% this reporting year for bacteriologically confirmed TB and 82% for clinically TB diagnosed.

When considering the treatment outcomes for all forms (DS&DR), it was observed that 88% (5038/5722) were successfully treated. For all susceptible TB, the treatment success rate was 88.2% (4985/5660) while 7.7% (436/5660) of them died and 2.2% (126/5660) were lost of follow up. For all TB/HIV co-infected patients-initiated ART, 77.9% (874/1122) were successfully treated for TB; 14.8% (166/1122) among TB/HIV co-infected patients on ART died and 5.0% (56/1122) were lost of follow up. The proportion of co-infected TB/HIV on antiretroviral therapy (ART) by the end of their TB treatment who were successfully treated was 77.9% for DS and 87.5% for DR co-infected TB/HIV.

TB prevention

We continue to scale up the provision of tuberculosis preventive therapy among PLHIV for newly enrolled to all PLHIV and continue provide preventive therapy to children under 5 years. During this reporting FY, 72% of eligible children under five were initiated on TPT and this decrease from 98%. For PLHIV, 52253 received TPT which represent 25.6% of all PLHIV enrolled on TB prevention since November 2019. This target should be high, but we faced an issue of availability of 3HP because manufacture reduced his production due to covid-19 pandemic in India.

As the TB NSP planned to implement TPT among contact above 5 years, we forecasted drugs and commodities needed to start enrolled contact of TB bacteriologically confirmed on TB prevention.

Systematic TB screening among health care workers (HCWs) and among community health workers have been conducted to prevent TB by early detection. The proportion of HCWs and CHWs screened for TB was 83% and 87% respectively during 2020-2021 FY.

TB program management and coordination

During 2019-2020 fiscal year, the division of Tuberculosis and other respiratory disease with support of WHO developed a guideline and e-learning modules for

management of susceptible and drug resistant TB, management of latent TB and active drug safety monitoring of TB.

Protocol on an evaluation of cost borne by TB affected household in Rwanda in collaboration with school of public health and WHO HQ was developed and received approval from Rwanda national ethic committee and visa from national institute of statistic. Data collectors were recruited, and sensitization meeting has been conducted. We delayed starting data collection due third wave of covid-19 pandemic.

Rapid quality assessment service was conducted in 161 health facilities to assess the quality of TB service provision. New checklist was developed to integrate new strategy set in our TB NSP and following components had poor score and need special attention du this year: monitoring of adverse drugs, functionality of TB diagnostic system, implementation of practical approach for lung disease, monitoring of BMI and provision of nutritional support, and Leprosy control.

Leprosy control

During this fiscal year, 14 leprosy cases were diagnosed among them 8 were women and 3 children under 15 years. The proportion of MB cases represented 64.3% and 21.4% leprosy cases detected had disability grade 2(G2D).

The treatment completion rates for PB registered from July 2019 to June 2020 and MB forms registered from July 2018 to June 2019 for new cases were 100%.

Damien Foundation has been our historical partner for leprosy control and their support ended in December 2020. There is a need to advocate for domestic and external funds to fight leprosy in Rwanda.

TB&ORD financing

During the Fiscal year 2020-2021, the total budget planned was USD 8,643,113 with contribution of 65.2% from Global Fund (GF), 33.6% from Government of Rwanda (GoR), 0.8% from World Health Organization (WHO) and 0.4% from Damien Foundation (DF).

The budget execution was at 96.7% The budget execution for funding from WHO, GoR, GF and DF was 100%, 104%, 92.6% and 99% respectively.

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ABBREVIATIONS

ACF	Active Case Finding
aDSM	Active Drugs Safety Monitoring
AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral Therapy
BCC	Behaviour change communication
CBHI	Community based health insurance
CDC	Centers for Disease Control and Prevention
CDT	Centre for Diagnosis and Treatment of Tuberculosis
CHUB	Butare University Teaching Hospital
CHUK	Kigali University Teaching Hospital
CHW	Community Health Worker
COVID-19	Coronavirus Disease 2019
CRVS	Civil Registration and Vital Systems
CSB	Corn -Soya Blend
CSO	Civil Society Organizations
CT	Centre for Treatment of Tuberculosis
CXR	Chest X-ray
DF	Damian Foundation
DH	District Hospital
DHIS2	District Health Information System version 2
DIAMA	Diagnostics for Multidrug-resistant tuberculosis in Africa
DOT	Directly Observed Treatment
DQA	Data Quality Audit
DS-TB	Drug Susceptible Tuberculosis
DR-TB	Drug Resistant Tuberculosis
DST	Drug Susceptibility Testing
DTC	Drug Therapeutic Committee
EPTB	Extra Pulmonary TB
E-TB	Electronic Tuberculosis surveillance system
EQA	External Quality Assessment
FDA	Rwanda Food and Drugs Authority
FNA	Fine Needle Aspiration
FY	Fiscal year
G2D	Grade 2 Disability
GDF	Global Drug Facility
GFATM	Global Fund for AIDS, TB and Malaria
GHSC	USAID Global Health Supply Chain Program
GoR	Government of Rwanda
HC	Health Center
HH	Household
HF	Health Facility
HFN	High False Negative
HFP	High False Positive

HIV	Human Immune Virus
HISP	Health Information Systems Program
HMIS	Health Management Information System
HRG	High Risk Group
HRTT	Health Resource Tracking Tool
HSSP	Health Sector Strategic Plan
IC	Infection Control
IEC	Information, education and communication
IPT	Isonizid Preventive Therapy
ISS	Integrated Supportive Supervision
LFN	Low False Negative
LFP	Low False Positive
LMIS	Logistics Management and Information System
LPA	Line Probe Assay
LTBI	Latent tuberculosis infection
M&E	Monitoring and Evaluation
MB	Multibacillary
MCCH	Maternal Child Community Health Division
MD	Medical Doctor
MDR-TB	Multidrug Resistant Tuberculosis
MDT	Multidrug therapy
MoH	Ministry of Health
MPPD	Medical Production and Procurement Division
MTB	Mycobacterium Tuberculosis
MTEF	Medium Term Expenditure Framework
MTR	Mid-Term Review
NCD	Non-Communicable Diseases
NGOs	Non-Government Organizations
NRL	National Reference Laboratory
NSP	National Strategic Plan
NTPB	New Pulmonary Bacteriological confirmed
NTWG	National Technical Working Group
NYC	National Youth Council
PAL	Practical Approach for Lung diseases
PB	Paucibacillary
PBF	Performance- Based Financing
PLHIV	People Living with HIV
PMDT	Programmatic Management of Drug Resistant Tuberculosis
PMEBS	Planning Monitoring Evaluation and Business Strategies division
PPA	Patient Pathway Analysis
QC	Quality Control
QE	Quantification Error
RBC	Rwanda Biomedical Center
RBF	Results Based Financing (of the Global Fund)

RDA	Rwanda diabetic associations
RH	Referral Hospital
RMH	Rwanda Military Hospital
RR	Rifampicin Resistant Tuberculosis
RRP+	Reseau Rwandais des Personnes vivant avec HIV
RSQA	Rapid Services Quality Assessment
SLD	Second Line Drug
SMART FMIS	Integrated Financial Management Information System
SOPs	Standard Operating Procedures
SPH	School of Public Health
SPIU	Single Project Implementation Unit (MoH)
TB&ORD	Tuberculosis and Other Respiratory Communicable Diseases
TIME	TB impact modeling estimate
TPB+	TB Pulmonary Bacteriologically confirmed
TPT	Tuberculosis Preventive Therapy
TSR	Treatment Success Rate
TWG	Technical Working Group
USD	United States Dollars
VOT	Virtually Observed Treatment
WHO	World Health Organization
XDR-TB	Extensively drug-resistant tuberculosis

1. INTRODUCTION

National TB program was established in 1990 by the Ministry of Health and the management of TB was integrated in health facilities and Gishali Sanatorium became a referral center for complicated TB cases until 1994 when the health system was dismantled due to the genocide against Tutsi. Before 1990, all TB cases were treated at Sanatorium in Gishali since 1954. The 1994-genocide resulted in a breakdown of the health system. After 1994, the National TB program (NTP) was rebuilt with assistance from the Damien Foundation. By 2003, full national coverage was achieved again, and DOT strategy applied in all health facilities countrywide.

Since 2003, the NTP launched many programs, including Community DOT in 2005 where community health workers were trained to provide treatment of TB patient nearest their home with aim to bring TB service close to the community. In February 2005, TB/HIV in integration of TB/HIV activities started cotrimoxazole prophylaxis and antiretrovirals therapies were initiated in 2006 for HIV positive and co-infected TB/HIV patients. During the same period, HIV testing was offered to all TB patients and since 2009 all presumptive TB were routinely offered HIV counseling and Testing.

The national TB program and leprosy in Rwanda is coordinated under tuberculosis and other respiratory communicable diseases Division (TB&ORD) which is under department of HIV/AIDS, Diseases Prevention and Control within Rwanda Biomedical Center.

The provision of TB services follows the Rwanda health pyramid. At community level, CHWs are responsible for community education and sensitization on TB symptoms and management and early identification of presumptive TB cases in their villages. They refer patients to the nearest health center and ensure direct observed treatment as key component of the community DOTS strategy. At sector level, health centers are responsible to identify presumptive TB cases and perform diagnostic of TB and provide treatment. We have center for treatment (CT) and center for diagnostic and treatment (CDT). Overall, centers for treatment identify presumptive TB patients, collect sample sputum and perform slide preparation to be sent to CDT laboratory for staining and microscopy examination. CDT and CT provide DOT to patient. Each CT is under the catchment area of a specific CDT.

At district level, all district hospitals are Centres of diagnosis and treatment (CDT) and provide operational support to Health Centers (whether CDT or CT) through coordination of activities. They provide supervision, mentorship and quality control of all TB technical work done at health centers. This includes quality control for laboratory related activities at CDT/CT and quality of TB case management as well as quality of surveillance data

Rwanda introduced the individual case-based surveillance system using District Health Information System (DHIS) 2 platform where each health facility records the individual patient data.

Rwanda developed the TB National Strategic Plan (TB-NSP) July 2019- June 2024 which gives a detailed view of the current state of TB control in Rwanda. The plan

illustrates the most pressing problems and their root causes, based on evidence and data gathered in Rwanda and elsewhere. The plan also describes what we want to achieve by mid-2024 and our strategic and technical process for addressing identified gaps. At international level, the most important policies providing guidance and direction to this NSP are the Sustainable Development Goals (SDGs), the End TB strategy and the Africa Health Strategy 2016-2030. Rwanda's vision is to end TB in 2035 attaining a reduction of the estimated TB incidence by 90% and mortality by 95% compared to 2015 levels. This plan aims to achieve the End TB milestones for 2024, including reduction of TB incidence by 35%, reducing TB deaths by 57% as compared to 2015 and ensuring reduction of TB affected families are facing catastrophic costs based on the result of the survey. TB NSP intends to achieve the 2022 UNHLM and the TB Global plan targets of more than 90% treatment coverage and more than 90% treatment success rate (TSR) for all TB patients by June 2024, at the latest.

2. CONSIDERING THE PATIENT PATHWAY FOR TUBERCULOSIS

2.1. Introduction

This strategic objective has three intervention which focus focuses on accelerating early TB screening and diagnosis with sensitive diagnostics tools, ensure quality of care and targets population at high-risk group to reduce TB burden by using the active case findings.

Early diagnostic by using active case finding approaches which requires a comprehensive set of activities, using improved screening and diagnostic tools at all levels of the health system.

High quality care for TB affected patient is ensured by free accessibility to TB service and care which is delivered efficiently by facilitation patient to receive treatment at home by community health care.

In addition, promotion of health seeking care is key to raise awareness of people by involving former TB patient on sensibilization and combat stigma.

The sections below highlighted the achievement of the above-mentioned interventions.

2.2. Accelerating early screening and appropriate diagnosis of TB

2.2.1. Screening and diagnosis

2.2.1.1. Screening of symptomatic clients with chest x-ray

In Rwanda, two screening methods are used to identify TB presumptive cases. Active case finding is performed among people attending health facilities or in the community and for those not classified as high-risk groups for TB. The second method of TB screening is performed among people classified as high-risk groups (HRG) to develop TB.

TB screening is based on four questions (cough of ≥ 2 weeks, fever, night sweats and weight loss). Community health workers (CHWs) contributed to screening by identifying people with symptoms related to TB and referred them to health centers for screening.

The total number of presumptive TB cases was 176,636 and 112,368 (**63.6%**) were referred by CHWs. We observed an increase of 25% of presumptive at HFs level (from 140860 in 2019-2020 to 176,636 in 2020-2021 there was also an increase of presumptive referred by CHWs from 43% in 20219-2020 fiscal year (FY) to 63.6% in this reporting fiscal year. The observed increased number of presumptive cases at HFs levels might be due to intensive active screening of covid-19, with TB being considered as differential diagnosing depending on duration of symptoms.

Among the total TB presumptive cases mentioned above, there was 2,207 who were screened positive on chest x-ray out of the total number of 14,917 of high-risk group in Rwamagana prisoners, People Living with HIV (PLHIV) from Ruhengeri referral hospital, Muhoza HC, Busogo HC and youth in rehabilitation centers.

2.2.1.2. Diagnostic techniques

Diagnostic capacity for TB has been strengthened in the country. GeneXpert is used for initial testing countrywide among HRG and presumptive TB cases in Kigali city because of high TB incidence compared to the rest of the country. While sputum smear, microscopy is used as an initial test for the rest of the presumptive TB cases and for treatment follow-up.

1,079 TB cases were diagnosed with smear microscopy out of 4,111 bacteriologically confirmed TB cases.

The total number of GeneXpert tests performed was 86,506 out of the 176,636 presumptive TB population. The total number of TB cases diagnosed with molecular testing as the initial diagnostic test represented 89.1% (3662/4111) of TB cases bacteriologically confirmed and 73.5% (3999/5439) of all TB case notified.

A total of 2842 mycobacterial culture was performed. Of 2842 cultures, 528 samples were from MDR-TB treatment follow-up, while 2314 were from eligible patients for drug resistance detection beyond GeneXpert. Excluding cultures performed for follow-up, the positivity rate was 19% (441/2314). The fact that most samples come from patients on first-line treatment (month 2 or 5 of treatment) could explain the low culture positivity rate. The overall contamination rate was 8% (123/2842) which is acceptable considering reference limit for liquid cultures. Table 1 shows an overview of nationwide cultures performed and their results.

Table 1: Culture performed in FY 2020-2021

	Samples received and processed for culture	**Samples for MDR-TB culture controls**	**Culture results for diagnostic**			
			Positive	Negative	Contaminated	Pending
NRL	2311	505	406	1245	99	0
CHUK	498	2	24	363	24	134
CHUB	33	21	11	18	0	0
Total	2842	528	441	1626	123	134

To ensure universal access to DST beyond GeneXpert, health facilities are requested to send samples for eligible patients such as those with persistent sputum smear positive at month 2 and retreatment to the NRL for culture and DST. The DST coverage using LPA or phenotypic DST was 35.1% (155/441) (Table 2). This very low DST coverage was due to 1) consequence of covid-19 pandemic

on routine activities at the NRL where most staff were fully involved in covid-19 testing, 2) stockout of LPA kits and shortage of other essential laboratory commodities. To overcome these issues, the NRL has recruited some staff to support covid-19 testing, thus allowing normal flow of other routine activities. To solve the recurrent stockout of laboratory commodities, possibility to consider a reliable supply chain system 'GDF' is being explored.

Table 2: Drug susceptibility testing (DST) of tuberculosis performed in Rwanda in FY 2020-2021

	Samples received			**Drug Susceptibility Testing**		
	New	Previously treated	Unknown TB history	**LPA** (1st line)	**DST** (1st line)	**DST** (2nd line)
NRL	915	228	53	115	29	29
CHUK	493	3	0	0	0	0
CHUB	0	11	0	11	0	0
Total	**1408**	**242**	**53**	**126**	**29**	**29**

The total number of presumptive TB cases is 176,636 with a positivity rate of 2.3 % (4,107 out of 176,636). This positivity rate decreased from 3.1 % of the 2019-2020 FY. CHWs brought 63.6 % of all presumptive TB and 31.95% of all sputum positive TB cases detected.

Table 3: TB detection and contribution of each screening level, Rwanda, July 2020-June 21.

DETECTION	**CDT**	**CT**	**CHWs**	**Total**
Presumptive TB cases	39,583	24,685	112,368	176,636
	22.4%	**14.0%**	**63.6%**	**100%**
B+ among presumptive TB cases	1,908	887	1,312	4,107
	46.46%	**21.60%**	**31.95%**	100%
Positivity rate	**4.8%**	**3.6%**	**1.2%**	**2.3%**

2.2.2. Quality control

Quality control (QC) is performed for smear microscopy and conducted quarterly for each CDT. This is done at two levels: the National Referral Lab (NRL) does the quality control for all hospitals; and District Hospitals conduct the quality control for CDTs in their respective catchment areas. From July 2020 to June 2021, quality control was done 3 times in 79.1% (159/201) of CDTs and 8933 slides were reviewed.

Table 4: Quality control of microscopy from July 2019 - June20.

	CDT controlled at least 3x	Nb slides controlled				Errors					Nb CDT with major error
		Total	Pos	Scanty	Neg	HFP	HFN	LFP	LFN	QE	
	159/201 (79.1%)	**8933**	**507**	**153**	**8239**	**0**	**7**	**1**	**1**	**2**	**6**
CDTs with Major errors	HFN: Remera Rukoma DH (1), Gihundwe DH (2), Mibilizi DH (1), Nyamata DH (1), Gakoma DH (1), Mugina HC (1)										

External quality control in FY 2020-2021

During this fiscal year, 42 out of 64 GeneXpert sites 65.6% received external proficiency panel from CDC-Atlanta. Of these, 59.4% (38/64) had a successful score but when considering only sites received proficiency panel, 90.5%(38/42) had a successful score. Table 5 shows an overview of proficiency panel results including the facilities, which fail to obtain the pass score.

Table 5: External quality control of GeneXpert sites in FY 2020-2021

	GXP sites	**Genexpert sites controlled**	**Genexpert sites with pass (≥ 85%)**	**Genexpert sites with no Pass**	**List of genexpert sites with no Pass**
Number	64	42	38	4	Gihundwe, Kabaya, Masaka, and Rwamagana DHs

The Rwanda National Referral Laboratory was successful in diverse proficiency panels including for microscopy, GeneXpert, culture, LPA and DST.

Besides activities, Rwanda NRL received a WHO nomination as candidate SRL with target to become full functioning SRL in the near future. Achieving the SRL status will be a cornerstone for high quality nationwide TB diagnostic services and

improved research capacity, while also providing technical support to other NRL within the region.

2.2.3. Notification of susceptible TB

2.2.3.1. Notification of TB by sex and age groups

The total number of TB cases diagnosed was 5,435 and 346 (6.4%) were children under 15 years. The majority of cases were male (72.1%) and the ratio male to female is 2.6. Almost half (49.6%) our TB cases are represented in age group of 25-44 years and 76.3% (4146/5435) were diagnosed among 15 to 54 years (see figure below). The figure shows the number of notified TB by sex and age groups.

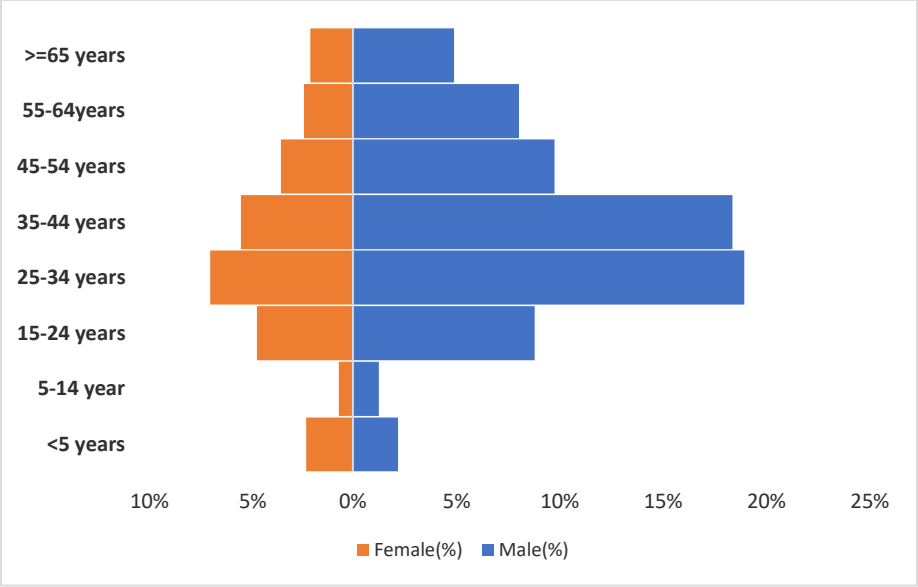

Figure 1: Age pyramid of TB cases, all forms, by sex, Rwanda, July 2020-June 2021

2.2.3.2. Notification by type, HIV status and tuberculosis history

Applying WHO criteria for TB cases classification, 75.6% (4,107/5435) were bacteriologically confirmed and 24.4% (1328/5435) were clinically diagnosed. Considering site of disease, 83.5% (4540/5435) were pulmonary TB case.

Almost all (5423/5435) notified TB cases were screened for HIV infection. The prevalence of HIV among all notified TB cases decreased from 19.9% (1132/5667) during 2019-2020 FY to 17.9% (973/5435) in the 2020-2021 FY.

The proportions of newly treated, previously treated and both new and relapse were respectively 92.1%, 7.9% and 99.0%. CHWs contributed to the diagnosis of

26.3% (1,432/5,435) of all TB cases registered. 98.4% (5,322/5,435) of all TB cases initiated the first line treatment.

2.2.3.3. Notification by districts and provinces

The City of Kigali, East, South, West, and North provinces respectively notified 29.4% (1599); 25.7% (1395); 20.8% (1132); 15.7% (852) and 8.4% (456) of total TB cases (see figure 2).

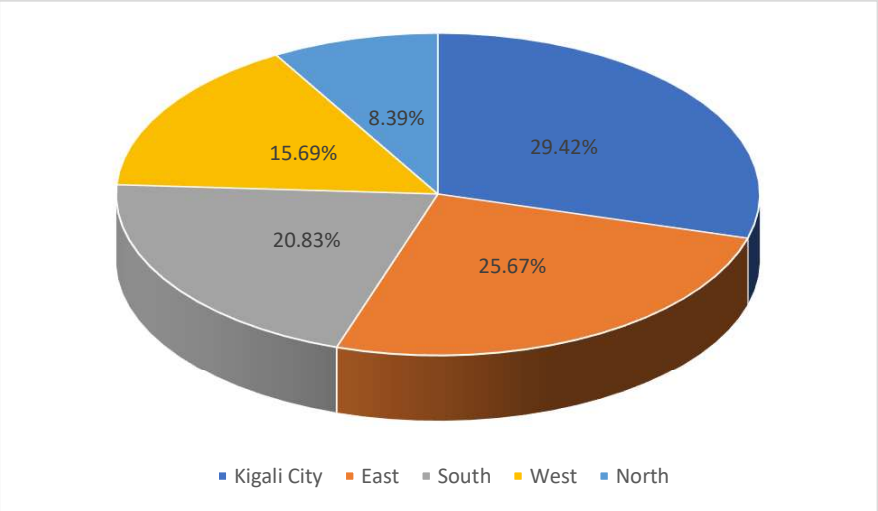

Figure 2: Distribution of TB cases by provinces

Five districts (Rwamagana, Kicukiro, Nyarugenge, Rubavu, and Gasabo,) have the highest notification (which is above 59/100 000 incidence, WHO estimation for the country).

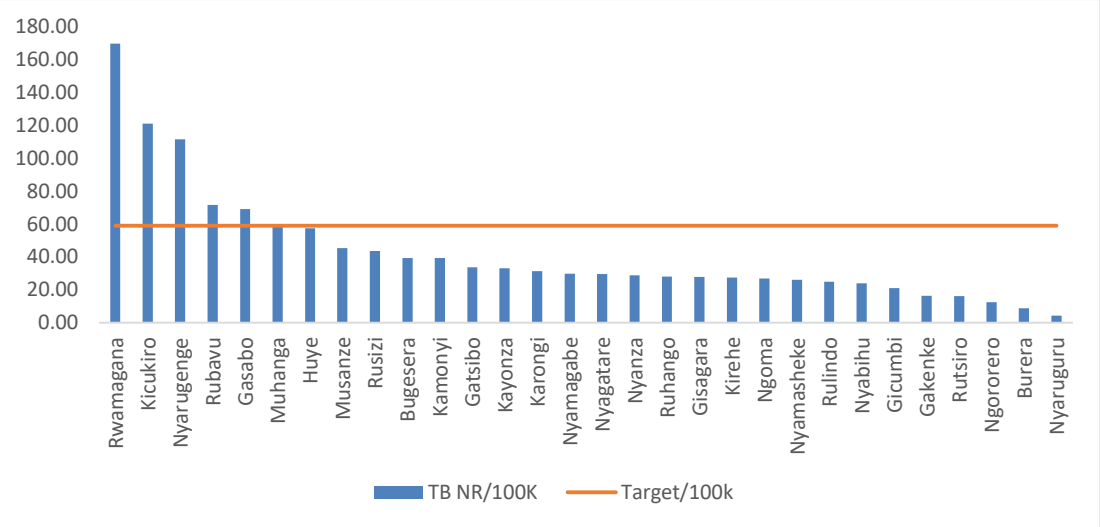

Figure 3: Notification of TB cases by district (per 100 000)

2.2.4. Drug susceptibility testing

WHO recommends universal drugs susceptibility to all TB patients, and to reach this target, there is a need to adopt use of molecular testing as first diagnostic test.

In Rwanda, around of 60% are using molecular test as first diagnostic and we aim to extend up to 80%.

Drug susceptibility testing was done for 73.56% (3,998) of all forms of TB cases. Drug susceptibility testing was 72.88% (3649/5007) and 81.54% (349/428) respectively for new and previously treated TB cases (see figure 4).

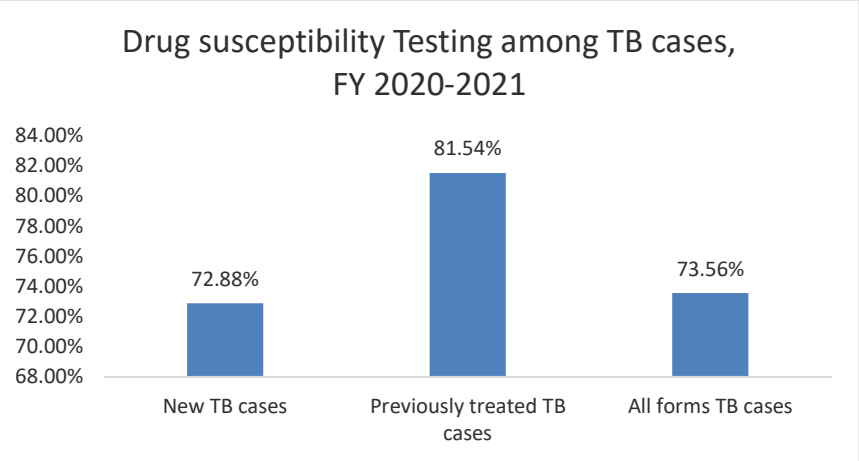

Figure 4: Drug susceptibility testing among TB cases, FY 2020-2021

Considering the trend as shown in figure below toward universal drug susceptibility. Rwanda was in good track, but the challenge faced in this reporting year was the breakdown of half of GeneXpert modules due to maintenance issue. In fact, this issue was solved by endorsing access to care, which will help to ensure functionality of our GeneXpert.

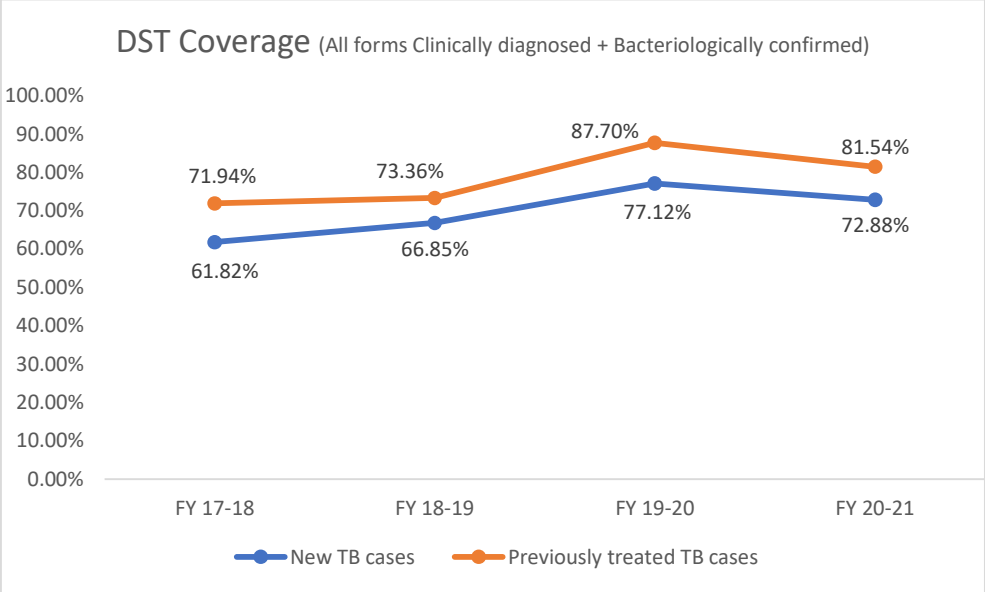

Figure 5: Drug susceptibility Testing trend from July 2017 to June 2021

The NSF framework provides the proportion of TB patients with DST for at least RR among the total TB notified cases (new and retreatment) and is calculated among all bacteriologically confirmed. Among bacteriologically confirmed TB patients, the DST was performed on 89.1% (3,661/4,107).

Key results

Indicator	Target 2020-2021	Results
Proportion of newly notified TB patients tested using WHO-recommended rapid molecular test at the time of diagnosis	65%	72.88% 3649/5007
DST coverage for TB patients.	75%	73.6% (3,998/5435)
Proportion of health facilities diagnostic sites scoring pass in EQA for smear microscopy	85%	79.1%
Proportion of health facilities Xpert sites scoring pass in EQA for Xpert MTB/RIF	60%	59.4%

2.3. Quality of care and ensuring a cure, including aDSM and patient support

2.3.1. Key activity might have sub-activity Treatment outcome

Treatment outcomes presented in this reporting period from July 2020 to June 2021 are from the cohort of TB cases registered from 1st July 2019 to 30th June 2020. Total TB cases registered in all forms were 5,721. Among them 5,592 TB

cases were initiated on 1st line TB treatment while 74 cases moved to 2nd line TB treatment. However, 76 cases started 2nd line TB treatment including 2 cases diagnosed in 2018-2019 but started treatment in July 2019.

Among bacteriologically confirmed new and relapse TB cases (B+ N&R), treatment success rate (TSR) was 90.2% (3818/4235), including 77.6% cured and 12.5% with treatment completed. For clinically diagnosed (CD), the treatment success rate was 82.2% (1097/1334).

The main unfavorable TB treatment outcome was "death" which represented 5.8% (245/4235) for bacteriological confirmed cases new and relapse and 14.3% (191/1334) for clinically diagnosed cases. TB cases not evaluated were respectively 1% (44/4235) and 0.1% (2/1334) for B+ N&R and clinically diagnosed.

We evaluated patient enrolled in first line regimen (5659) in 2019-2020 and in second line regimen in 2019-2020 for shorter regimen (60) and in 2018-2019 for longer regimen (2). When considering the treatment outcomes for all forms (DS&DR), it was observed that 88% (5042/5721) were successfully treated, with the success rate, 93.3% (2237/2397), in patients followed by CHWs. For all susceptible TB, the treatment success rate was 88.2% (4989/5659) while 7.7% (437/5659) of them died and 2.4% (133/5659) were lost of follow up. For all TB/HIV co-infected patients initiated ART, 77.9% (874/1122) were successfully treated for TB; 14.9% (167/1122) among TB/HIV co-infected patients on ART died and 5.3% (59/1122) were lost of follow up.

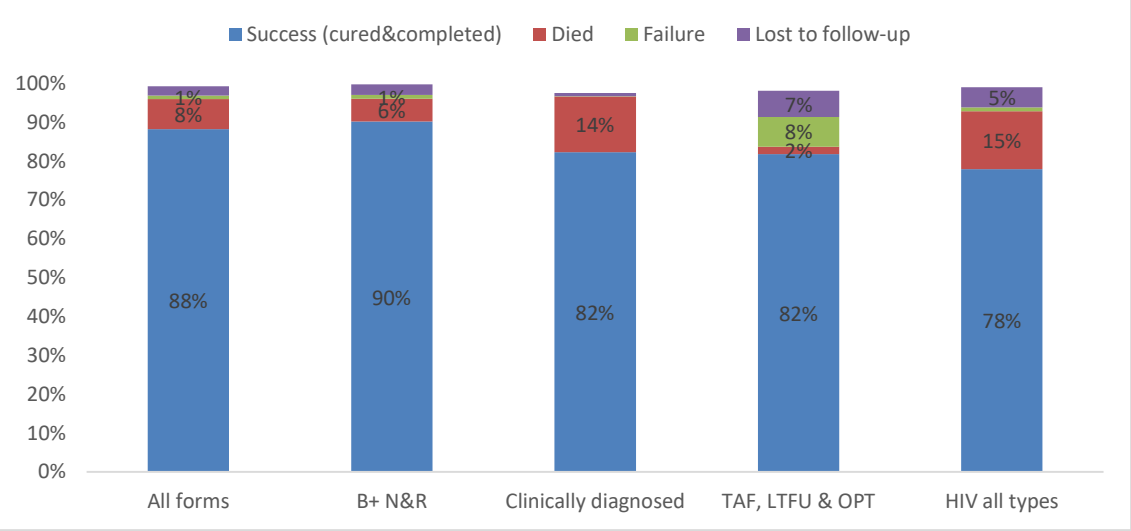

Figure 6: TB Treatment outcomes for the TB cohort registered during July 2019-June 2020, by case category and in special populations.

** OPT: Other previously Treated TB cases*

When comparing the treatment outcome by District hospital catchment area, 18 Hospital performed well with TSR above 90% for all TB cases forms. These

hospitals were Ngarama, Kibilizi, Nyamata, Muhororo, Gisenyi, Mugonero, Kiziguro, Kabgayi, Rutongo, Gitwe, Ruhengeri , Ruhango, Gihundwe, Rwamagana, Nyagatare, Gatunda, Gakoma and Kirehe.

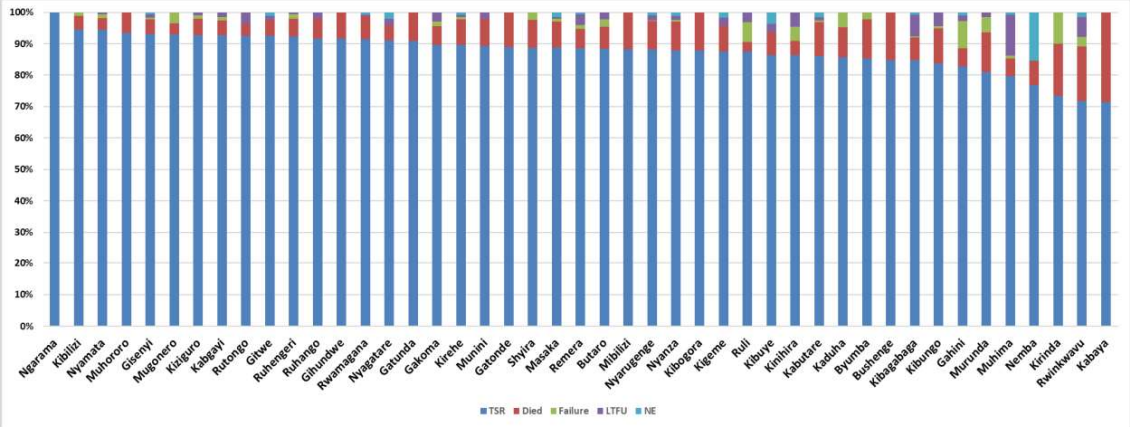

Figure 7: TB treatment outcome by for cohort July 2020-June 2021.

We really commend the effort made by 13 hospitals (Mugonero, Gahini, Ruhengeri, Gitwe, Nyamata, Kibilizi, Gihundwe, Masaka, Ngarama, Bushenge, Rutongo, Muhororo and Murunda) in improving patient follow up and increasing their performance in terms of treatment success rate in comparison with the previous fiscal years.

2.3.2. Nutrition support

Adequate nutritional intake is essential to ensure adequate absorption of TB drugs to meet the increased demand of body metabolism and required nutrients, thus contributing to a quick patients' recovery. We integrated this fiscal year an indicator related to nutrition support. The NSP 2019-2024 advocates for the provision of nutritional support to all TB patients who have moderate and severe malnutrition (BMI below 18.5). During this FY, among TB case notified 47.8% (2597/5435) have moderate and severe malnutrition and, around 42% of them (1082/2597) received supplemented food composed by Corn-Soya Blend (CSB). In general, 26,686 kg of CSB and 74,400 pieces of RUTF were distributed to hospitals.

2.3.3. Use of digital tools for treatment supervision

The treatment of Tuberculosis requires daily intake of multiple medications for 6 months or 2 years or more (MDR patients). The long duration of TB treatment provides an opportunity for the interruption of medication that could eventually lead to the emergence and transmission of drug-resistant-TB in the absence of strong and structured adherence support. Directly observed treatment administration together with patient support has been recommended to improve

adherence to TB treatment. However, daily treatment observation presents challenges for both patients and health facilities, specifically during this COVID-19 pandemic. Digital technologies like video (virtually) observed treatment (VOT) are being considered to improve patient adherence. VOT requires patients to film themselves taking medications on a computer or mobile device, then transmit these images to a remote observer via internet. TB NSP 2019-2024 has among other adherence strategies the implementation of VOT for TB patients. Staff at the central level have been introduced on the use this new technology, computers for VOT implementation purchased, the distribution of tools and training of health facilities staff on their effective use are planned for the next fiscal year.

2.3.4. Supply of first line TB drugs.

The national TB technical working team for management of TB commodities conducted stock monitoring at all levels and regular follow up of shipments of medicine in the pipeline to ensure the availability of TB medicines and diagnostic commodities in all health facilities. The monitoring of stock status and in pipeline is routinely done at the central level. Monitoring of stock level is conducted on monthly basis at central level and none stock out was reported during the reporting period. According to the e-LMIS reports, 91.0% reported no stock out during the fiscal year of 2020-2021. However, we noticed quality issue of data reported in e-LMIS because none of HFs reported shortage of first line medicines at central level. There is a need to strengthen capacity of e-LMIS users to reinforce quality of data reported in the system.

2.3.5. Improve quality of care for TB patients

High quality care for TB involves early and accurate diagnosis, including drug-susceptibility testing. Diagnosis should be followed by rapid initiation of the correct drug regimen, patient support, and management of relevant comorbidities. During this FY 2020-2021 different activities have been conducted to improve the quality of care by providing mentorship and analysis of verbal autopsy results. The TB program in collaboration with expert physicians conducted a field visit in hospitals with high TB mortality rates:

- to improve provision of TB services,
- build capacity of medical doctors and nurses at provincial and district hospitals,
- conduct a staff meeting on management of unfamiliar or complicated cases of TB and strengthen collegial decisions to avoid TB diagnostic errors and improve early detection.

Sixty-one selected health facilities within 16 districts (Gasabo, Kicukiro, Rubavu, Rwamagana, Huye, Nyabihu, Musanze, Rusizi, Nyamasheke, Rulindo, Nyanza, Ngoma, Ruhango, Gisagara, Karongi and Kayonza) from 16 to 20 November 2020,

27 July to August 2020, 08 to 12 February 2021 and 29 March to 02 April 2021 beneficiated with this mentorship. An observation check list approved by staff from the TB & ORD Division was also used to assess the risk factors which caused poor outcomes in those District hospitals. The checklist was filled for the selected HFs and the following observations were made:

- In OPD: IEC on TB and cough triage were not regularly done in 33 out of 61 Health facilities visited.
- In hospitalization: Screening of TB is not done systematically during ward round in all 16 Hospitals visited and there is no collegial decision for TB patients clinically diagnosed before initiating TB treatment to minimize errors in TB diagnostics in 14 out of 16 Hospitals visited.
- TB service: bilan pre-treatment and monthly monitoring of side effects & its management was not implemented in 22 out of 61 HFs and radiological follow-up not done in the 16 hospitals visited.
- Diagnostic Capacity: Body fluid analysis for EPTB diagnosis not done in the 11 out of 16 Hospitals visited.

From the findings, it was recommended that mentorship and supervision should be consistent for prevention of poor treatment outcome among TB patients. TB&ORD Division requested every hospital to conduct a verbal autopsy for all deaths that occurred among TB patients. A checklist was developed and filled by health care providers at health facilities. Then they sent it to central level for analysis. We analysed data on deaths that occurred during the treatment of patients notified from July 2019-June 2020. We received 74 death audit reports out of 433 death reports during the analysed period and following observations were made:

- 69% (2/3) of patients who died were malnourished
- HIV was the second leading cause of death (38%)
- 76% of deaths occurred during the first two months of TB treatment.

Key results

Indicator	Target 2020-2021	Results
Treatment success rate for all forms of TB cases (DS & DR-TB cases)	86.5%	88.1% (5042/5721)

2.4. Promoting care seeking and prevention through community engagement

2.4.1. Behavior change communication (BCC)

Behaviors Change Communication (BCC) has been successfully used by various health promotion programs to improve the well-being of populations. It's a communication strategy which encourages individual or community to change their behaviour, and promoting changes in knowledge, attitudes, norms, and beliefs.

In the line of promoting healthcare seeking for tuberculosis related symptoms and/or tuberculosis signs, TB&ORD Division conducted several activities for increasing TB awareness in the general population and TB sensitization through radio and TV talks during the fiscal year 2020-2021.

IEC/BCC messages were aired on local private radios, public radios (Community radios and National Radio), and international radio stations and in newspapers, and they were performed as follow:

- ✓ 13 Live talk show programs on Radios Flash FM, Isango star, and RBA and 2 interviews on Television that's RBA and Isango TV,
- ✓ 2 Radio spot on Flash FM, Isango Start and RBA

Below are topics related to tuberculosis awareness (diagnosis and prevention) covered during this fiscal year:

- ✓ Importance of TB screening among health care workers
- ✓ Knowledge on cause, transmission, symptoms, screening, diagnostic and prevention measures of TB
- ✓ Tuberculosis in children
- ✓ Detection and diagnosis of TB in health centers: extra pulmonary TB, early screening and treatment of TB and follow up of TB patients
- ✓ Friend to friend social media campaign against Tuberculosis.

Celebration of the World TB Day 2021

During this fiscal year Rwanda Joined the rest of the World to celebrate world TB Day. Given the context of COVID-19 pandemic, we celebrated the event virtually by conducting two events: online conference with partners, heads of all hospitals and their TB focal points and supervisors and the online concert held by TB ambassador in Rwanda Mico the Best with his colleagues.

The Webinar meeting was chaired by the Head of Clinical and Public Health Services Department in the Ministry of health, who represented the Ministry of health and co-chaired by the Head of HDPC/RBC and WHO representative. TB program presented the TB epidemiology in Rwanda, success and challenges; impact of covid-19 on TB diagnostic and follow up and new intervention to scale up from July 2021 on tuberculosis preventive therapy among TB contact. This was a successful event where health care providers committed to improve the diagnostic of TB.

The second event was a live entertainment in collaboration with KIKAC music which manages MICO the Best, the TB ambassador who accepted to perform this online concert. Other talented artists joined the TB ambassador to entertain Rwanda people and those artists are Riderman and Anita Pendo who was the master of ceremony. During the live concert, one of the former MDR TB patient presented his testimony by calling people to seek care early and follow the recommendation from the health care providers.

The Honorable Minister of Health; Dr Daniel Ngamije provided the speech of the day, where he emphasized on the situation of TB in Rwanda, efforts of the Rwanda Government in fighting against tuberculosis and increasing domestic fund, role of population on TB prevention and call partners to continue supporting Rwanda given that this disease being among the most killer worldwide.

This event was so far watched by 7,800 people on YouTube and 386,000 views on Instagram. During the live concert message on early TB screening and diagnostics were scrolled down and TB division staff responded to some questions raised by attendees.

Other awareness activities during the World TB Day 2021, were performed through various communication channels:

- ✓ A live talk show on RBA (Rwanda Radio), Flash FM, Isango Star and Umucyo Radio,
- ✓ Radio Spot on World TB Day by RBA, Flash FM, Isango star radio
- ✓ TV spot on World TB Day by RBA, Flash TV and Isango TV
- ✓ Media papers: Igihe.com, News Times, Inyarwanda.com, Hose Intertainment, news for Rwanda, Kigalihit.rw, Rwandamagazine.com, Kitpress.rw.

2.4.2. Tuberculosis preventive therapy among contacts of TB cases (all ages)

Tuberculosis (TB) contacts are people who have close contact with infectious TB patients. As they are at high risk for infection, TB contacts might be systematically and actively investigated for TB infection and TB disease.

Household contacts of TB cases are our focus, and a systematic contact investigation was conducted using a symptoms-based approach, for children under 5 years old and people above 5 years old.

2.4.2.1. Management of latent TB infection (LTBI) under 5 years old

During July 2020 – June 2021, 99.8% (1,297/1,300) of all children under 5 years who were contacts of pulmonary tuberculosis bacteriologically confirmed cases,

were screened for TB. Of them 11.7% (152/1,297) were identified as presumptive TB cases and 15.1% (23/152) diagnosed with TB among presumptive TB.

The number of under 5 years contacts of pulmonary tuberculosis bacteriologically confirmed cases-put on TPT was 1,167(91.4%).

The figure below, shows the cascade of contact investigation in under 5 years as well the IPT coverage.

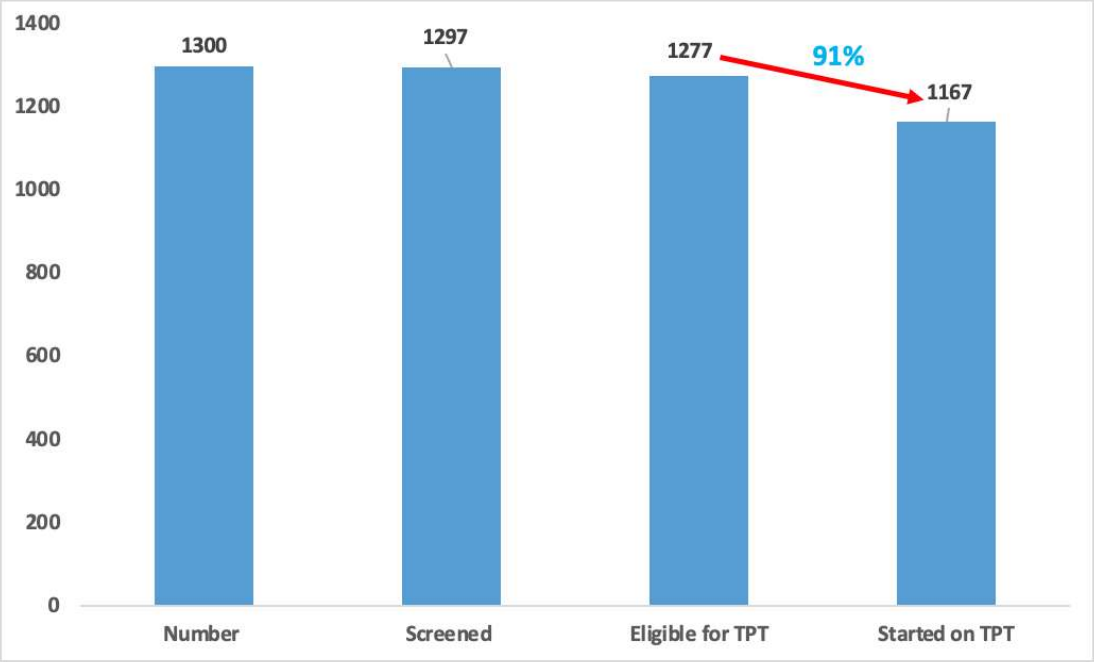

Figure 8: Under 5 years initiated on tuberculosis preventive therapy, July 2020-June 2021.

2.4.2.2. Management of latent TB infection (LTBI) for adult

So far, the TPT in adult household contacts of confirmed TB patients is not yet implemented. However, preparatory phases have already started.

Since 2020 the Rwanda National TB Program started developing the TPT guidelines with the support of the WHO, and we have already a final draft that should be soon validated. Clear eligibility criteria for TPT intended to household contacts of TB confirmed patients, have been defined. They should be first of all screened and get tested on Tuberculin Skin Test (TSK), and those tested positive shall be initiated on TPT.

In additional, the forecasting and procurement of TPT drugs for adult household contacts of TB confirmed, has been made.

We plan a practical training session on TST for TB&ORD staff, then we will continue with TB focal point from 5 hospitals with their catchment areas. Those 5 Hospitals shall be taken as pilot hospitals across the country for TPT implementation in adult household contacts of TB patients. The scale up shall follow progressively, based on lessons learnt from the pilot hospitals.

During FY 2020-2021, 99.4% (15,902/15,991) of TB household contacts above 5 years old were screened for Tuberculosis and 22.4% (3,565 /15,902) were identified as presumptive TB cases.

The table below highlights the TB contact investigation cascade:

Table 6: Household TB contact investigation, Rwanda. July 2020-June 2021

	Total contacts of TPB+	**Total contacts screened**	**%**	**Presumptive TB**	**%**
Contacts of TPB+ ≥ 5 years	15,991	15,902	99.4%	3,565	22.4%
Contacts of TPB+ <5 years	1,300	1,297	99.8%	152	11.7%
Total contacts	17,291	17,199	99.5%	3,717	21.6%

Key results:

Indicator	**Target 2020-2021**	**Results**
Contact investigation coverage	>=90%	99.5% (17,199/17,291)
Proportion of eligible household contacts under 5 years who are contacts of bacteriologically confirmed index patients, who are started on TB preventive therapy	90%	91.4% (1,167/1,300)
Proportion of eligible household contacts 5 years and older who are contacts of bacteriologically confirmed index patients, who are started on TB preventive therapy	NA	NA

3. TARGETED APPROACHES FOR KEY DRIVERS OF TB EPIDEMIC AND SELECTED POPULATIONS:

3.1. Introduction

This strategic objective has 6 key interventions which are:

- Enhancing Programmatic Management of Drug – Resistant Tuberculosis

- Ensuring prevention, diagnosis and treatment of Childhood Tuberculosis: this intervention aim to close the case finding gap among children by using sensitive tools and building knowledge, skills and confidence of health workers to screen and diagnose TB in children.
- Strengthening management of TB / HIV and other co-morbidities: this intervention aims to maintain successes in area of screening and treatment for and reduce TB/HIV mortality by implementing tuberculosis preventive therapy. In additional, a TB-diabetes collaborative framework has been developed in collaboration with the RBC/NCD Division to implement systematic TB screening among diabetics in a limited number of HFs with proper monitoring to evaluate the yield of the strategy before scale-up.
- Ensuring diagnosis and management of Lung health diseases: this intervention aims to reinforce the management of respiratory chronic diseases (asthma and COPD) in close collaboration with NCDs Division with the purpose to ensure quality of care management and TB screening among these groups as cough is their main symptom and reduce the misuse of antibiotics.
- Promote intensified screening and diagnosis of high-risk group (HRG) populations which aims to target people at high risk to develop TB and use of molecular diagnostic test as first test to diagnose TB. We also conducted systemic screening using chest x-ray in specific group like prisoners, minors and PLHIV.

The sections below highlight the achievement of the above-mentioned interventions.

3.2. Enhancing Programmatic Management of Drug – Resistant Tuberculosis

3.2.1. Diagnostic and Notification of MDR-TB

Since January 2020, Rwanda changed the diagnostic algorithm for GeneXpert based on findings from DIAMA study implementation where a lot of false positive rifampicin resistant (RR) cases have been detected on Xpert MTB/Rif machines among low bacilli load sputum samples. The new algorithm was approved and disseminated for implementation in all GeneXpert sites **(Annex algorithm**). However, it has been identified several issues during its implementation mainly on the use of the results in the clinical decision-making:

- patients did benefit from Xpert repeat nor put on TB treatment,
- patients were wrongly refused treatment because Xpert repeat did not confirm MTB detection,
- samples from low bacillary load RR-TB cases were sometimes not sent to NLR for further investigations.

Therefore, the TB&ORD Division decided to send another message to all health facilities requesting them to always communicate any RR-TB results to the MDR-TB Unit staff for interpretation and health facility orientation on further steps.

A total of 3998 (73.6%) out 5435 TB cases notified during July 2020-June 2021 fiscal year have benefited from a drug susceptibility testing and 28 cases were rifampicin resistant. The table below shows distribution of cases by provinces

Table 7: RR-TB cases notified during July 2019-June 20, by province of origin.

Province		**East**	**Kigali City**	**North**	**South**	**West**	**Total**
RR/MDR-TB cases	N	2	13	2	9	2	28
	%	7.14	46.43	7.14	32.14	7.14	100

The modification of the Xpert MTB/Rif diagnostic algorithm and lockdown could have probably contributed to the 63.16% reduction in numbers of resistant TB cases in Rwanda, during July 2020 – June 2021 period compared to the previous 2019-2020 fiscal year. Most of the RR-TB cases (64.29%), were diagnosed among new cases before any TB treatment initiation.

Table 8: Repartition of MDR-TB cases by categories of origin, July 2020-June21.

Previous treatment history	**Bacteriologically confirmed+**	**Clinically diagnose**
New	18	0
Relapse	5	0
Treatment after failure	5	0
Total	28	0

Regarding the HIV status, all of them (100%) knew their HIV status and 8 (28.57%) patients were HIV+. Nineteen RR-TB cases were male which represented 67.86% and sex ratio male to female was 2.11.

Table 9: MDR-TB cases by gender, age and HIV status, July 2020-June21.

	Bacteriologically Confirmed		Clinically Diagnosed	
	Male	Female	Male	Female
MDR-TB patients	19	9	0	0
MDR-TB patients HIV Tested	19	9	0	0
MDR-TB patients HIV Positive	6	2	0	0
MDR-TB patients HIV positive on ART	6	1	0	0
MDR-TB patients under 15 years	0	0	0	0
MDR-TB patients under 15 years HIV Tested	0	0	0	0
MDR-TB patients under 15 years HIV positive	0	0	0	0
MDR-TB patients under 15 years HIV positive on ART	0	0	0	0
MDR-TB - Extensively Drug Resistance	0	0	0	0

All admitted RR-TB patients must provide samples for first- and second-line drug susceptibility testing. With reference made to data entered in electronic registers from April 2020 to March 2021 only 58.8% (20/34) have been tested for 2nd line DST due to the high proportion (26.5%) of primary negative cultures and 14.7% pending results.

3.2.2. Drug resistant tuberculosis treatment initiation

During 2020-2021 FY, Rwanda implemented the reviewed WHO recommendation published in December 2018 and the four different options were used:

- Shorter regimen (Newly RR/MDR-TB diagnosed cases):
  4Am– Cfz – E – Z – Mfx – H – Pto /5Cfz – E – Z – Mfx
- Longer regimen (RR/MDR-TB cases not eligible to the shorter regimen):
  6Bdq – Lzd – Lfx – Cfz – Cs/12Bdq – Lfx – Cfz – Cs
- Pediatric: 6Dlm – Lzd – Lfx – Cfz – Cs/12Lfx – Cfz – Cs
- Pre-XDR FLQ/XDR: 6Bdq – Lzd – Cfz – CS – Dlm – Z/12Bdq – Cfz – Cs – Z

TB&ORD Division supported by a WHO consultant reviewed the national drug resistant tuberculosis guidelines. The new national DR-TB guidelines handbook emphasizes on the use of all-oral treatment regimens for DR-TB patients and the active drug safety monitoring and management (aDSM). New treatment regimens for drug-resistant TB patients were designed according to the new WHO recommendations. The new DR-TB treatment regimens have been presented to the TB&ORD Division staff for further dissemination to health facilities countrywide. The following are four different DR-TB treatment options currently available in Rwanda:

- Shorter regimen (Newly RR/MDR-TB diagnosed cases):
  4Bdq-Lfx-Cfz-Pto-H-E-Z / 2Bdq-Lfx-Cfz-E-Z / 3Lfx-Cfz-E-Z
- Longer regimen (RR/MDR-TB cases not eligible to the shorter regimen):
  6Bdq–Lzd–Lfx–Cfz or Cs / 12Lzd-Lfx–Cfz or Cs
- Longer regimen for RR-TB with fluoroquinolone resistance:
  6Bdq–Lzd–Dlm–Cfz–Cs / 12Lzd–Cfz–Cs– [Bdq or Dlm]
- Longer regimen for RR-TB in central nervous system:

12Bdq–Lzd–Dlm-Lfx–Cfz–Cs–Z–[H or Pto] / 6Lfx– Cfz–Cs–Z– [Lzd or H or Pto]

The new treatment regimens were effective starting from July 2021.

During the July 2020 – June 2021, 26 bacteriologically confirmed RR-TB cases have been initiated on second line MDR-TB treatment regimen in MDR-TB centres; among them, 3 and 23 patients were hospitalized in Kibagabaga and Kabutare DHs respectively. Most of the patients (22) were initiated on a shorter regimen while the 4 remaining patients were treated with a longer all-oral treatment regimen.

3.2.3. Treatment outcomes of MDR-TB patients

Sputum culture conversion is a step on the way to achieve high MDR-TB treatment success rates. Culture conversion at six months is defined as a MDR-TB patient with negative culture at the end of six month of treatment. 59 cases of MDR-TB patients who initiated 2nd line TB drugs were laboratory confirmed. At six months of treatment, 49 were culture negative.

Table 10: Interim results- culture conversion at six months for cohort initiated on treatment during October 2019-September 2020.

Nb confirmed MDR-TB	Deaths before 6 months	Lost to follow-up before 6 months	Negative culture	≥ 1 positive culture	culture not done	Contaminated culture
59	2	0	49	0	6	2
	3.4%	0%	83.1%	0%	10.2%	3.4%

During the July 2020 – June 2021, we evaluated 60 patients who started shorter regimen from July 2019 to June 2020 plus two patients initiated on longer regimen in 2018-2019 FY. Among 76 MDR cases initiated on 2nd regimen in 2019-2020 FY, sixteen cases were treated with longer regimen and will be evaluated next 2021-2022 FY. The treatment success rate was 95.2% (59/62) including 50 (80.6%) cured. The treatment success rate among HIV co-infected patients was at 87.5%(14/16).

Table 11: Final treatment outcome: confirmed MDR-TB patients enrolled on the shorter and longer MDR-TB treatment regimen.

MDR-TB Final Treatment Outcomes	RR-TB and MDR-TB (shorter regimen)		RR-TB and MDR-TB (longer regimen)	
	HIV Negative	HIV positive	HIV Negative	HIV Negative
MDR-TB_DR-TB Registered patients who initiated the treatment	45	15	1	1
MDR-TB_DR-TB Patients Cured	37	11	1	1
MDR-TB_DR-TB Patients Treatment completed	7	2	0	0
MDR-TB_DR-TB Patients Treatment failed	0	0	0	0
MDR-TB_DR-TB Patients Died	1	2	0	0
MDR-TB_DR-TB Patients Lost to follow up	0	0	0	0
MDR-TB_DR-TB Patients Not evaluated	0	0	0	0

3.2.4. Adverse drugs reactions among MDR-TB patients

TB disease can be deadly, but the drugs used to treat the disease can also be harmful in many ways. Second-line anti-TB drugs have many more adverse effects than the first-line anti-TB drugs. Close monitoring of patients is necessary to ensure that the adverse effects of second-line anti-TB drugs are recognized quickly and properly managed. The active drug-safety monitoring and management is a new concept in TB and MDR-TB management in Rwanda. Its reporting form has recently been introduced in TB and MDR-TB tools (patients files and e-TB). The table below is presenting frequency of grades from different adverse events reported in the e-TB during this annual reporting period.

Out of 26 reported adverse events during the July 2020 – June 2021 period, only 1 (case with hearing loss) was on grade III.

Table 12: Patients who developed adverse events on MDR-TB treatment.

Treatment regimen	Grade I	Grade II	Grade III	Grade IV
Shorter treatment regimen	6	11	0	0
Longer treatment regimen	5	3	1	0

Regarding the long-term treatment outcome, we started to implement the follow up this fiscal year and data will be available on the report of 2021-2022 FY.

Capacity building of health care providers on MDR-TB management

TB&ORD Division in collaboration with Rwanda Food Drug Authority (RFDA) and with support of WHO Rwanda Country Office, developed a national TB drugs pharmacovigilance guidelines including active drug-safety monitoring (aDSM), reporting tools and training materials. eLearning modules are under development and participants will be enrolled to follow the course before end of 2021.

Key results:

Indicator	Target 2020-2021	Results
Proportion of notified patients with rifampicin resistant (RR) or MDR who receive second line DST	90%	58.8% (20/34)
Proportion of RR/MDR TB followed one year after treatment	NA	NA

3.3. Ensuring prevention, diagnosis and treatment of Childhood Tuberculosis

3.3.1. Diagnostic and notification of childhood TB

During July 2020 – June 2021, 346 under 15 years all TB cases (5435) were notified which represents 6.4%. The proportion of children under 15 years new and relapse represented 99.4% (344/346).

We observed a good detection rate (more than 8.5% of national target) of TB among children. In some hospitals' catchment areas like Ruli, Remerarukoma, Kabgayi, Nemba, Munini, Gahini, Shyira, Kigeme, Gakoma, Bushenge, Kirehe, Mugonero and Kaduha, while others did not notify any case or have low (less than 8.5% of national target) notification of TB among children under 15 years (Nyanza, Kiziguro, Kirinda, Kinihira, Kibogora, Gatunda and Gatonde etc..).

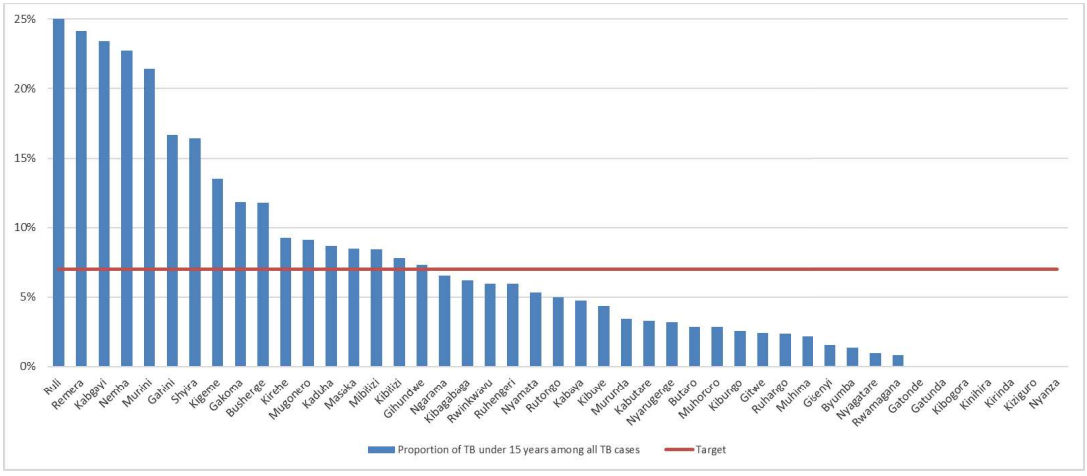

Figure 9: Proportion of TB notification among children by hospital catchment area

3.3.2. Treatment outcome of childhood TB

The success rate for children under fifteen years registered during July 2019 up to June 2020 is 93.0% (294/316). Other outcomes were death with 5.4% (17/316), not evaluated 1.3% (4/316) and lost to follow up 0.3% (1/316), two cases moved to 2nd line treatment. The treatment success rate among children under 15 years is higher compared to those above 15 years.

Table 13: Treatment outcome of TB patients under 15 years for the cohort notified, July 2019-June20.

Treatment Outcome								
	Registered	Moved to SLD*	Cured	Treatment complete	Treatment failed	Died	Lost to follow-up	Not evaluated
Children 0-14 Years	318	2	55	239	0	17	1	4
Percentage			93.0%		0%	5.4%	0.3%	1.3%

3.3.3. Outcome of latent TB infection (LTBI) under 5 years

For two consecutive years (July 2019-June 2020 and July 2020-June 2021), the outcome of latent TB infection among children under 5 years was not reported. In fact, there was a shift from HMIS to electronic case-based TB register (e-TB), and the indicator about outcome of latent TB among children under 5 years was missed, for the current fiscal year. This issue will be addressed in the near future.

3.3.4. Management of childhood TB in Rwanda

During this fiscal year, the following activities were conducted in order to improve management of childhood TB in Rwanda: childhood TB mentorship, workshop with IMCI national trainers and childhood TB technical working group (TWG) meeting.

3.3.4.1. Childhood tuberculosis mentorship

This mentorship has been conducted in collaboration with Rwanda pediatric association from 10th up to 14th May 2021, to reinforce knowledge on diagnostic and management of childhood TB in 6 hospitals which are Kirehe, Kigeme, Munini, Butaro, Remera – Rukoma and Kibogora and some selected HCs in their catchment area. Following are key recommendations made:

- Reinforce systematically TB screening to all children with severe acute malnutrition or not responding to food supplementations.
- District hospital to reinforce mentorship at health center on use of TB algorithm for pediatric TB diagnosis.

3.3.4.2. Improve collaboration with MCCH program

From 31st May to 04th June 2021, TB&ORD division in collaboration with MCCH program has organized a workshop to improve collaboration with maternal child and community health program and to leverage knowledge of national IMCI trainers on Childhood TB-HIV management. In addition, we discussed challenges in IMCI and Childhood TB-HIV management and formulated recommendations as follow:

- Disseminate key message related to childhood TB screening, diagnosis and treatment during mentorship and training conducted in IMCI service.

3.3.4.3. TB Childhood committee

From 09 to 11 June 2021; TB&ORD Division in collaboration with partners has organized a pediatric TB/HIV sharing experience meeting with aim to share key achievements, challenges and how to improve childhood TB management. We updated the checklist for childhood TB mentorship and way forward to improve childhood TB notification. During this meeting, the following recommendations were formulated:

- ✓ Advocate for shifting nutrition support from 3 to 6 months for TB/HIV co-infected patients and children with active TB.
- ✓ Conduct monitoring of childhood TB screening in private clinics trained on childhood TB management.
- ✓ Advocate for the integration of childhood TB screening in the pediatrics checklist used during RPA mentorship.
- ✓ Training on sample collection technics for all health care providers.

Key results:

Indicator	**Target 2020-2021**	**Results**
Proportion of children 0-14 years notified among TB case new and relapse	8.5%	6.4% (346/5435)
Proportion of children with TB successful treated	90%	93.0 % (294/316)

3.4. Strengthening management of TB / HIV and other co-morbidities

3.4.1. TB and HIV co-infection

3.4.1.1. Screening of HIV among TB presumptive and cases

One of the strategies Rwanda has implemented, is the HIV testing among presumptive TB patients. Among 176,636 TB presumptive cases registered, 12.1% knew their HIV status and 87.8% didn't know their HIV status of whom 99.7% were tested for HIV. The HIV prevalence among TB presumptive cases was 12.6%. See table below.

Table 14: Screening of HIV among TB presumptive cases, July 2020-June21.

Screening of HIV among presumptive TB	
TB Presumptive living with HIV/AIDS	21,406
TB Presumptive with unknown HIV status	154,948
TB Presumptive with unknown HIV status tested for HIV	154,615
TB Presumptive with unknown HIV status whose Status become HIV+ (after test)	770
Total HIV positive presumptive	22,176

3.4.1.2. Active case finding (ACF) in PLHIV

During this fiscal year 2020-2021, we conducted an active case finding among PLHIV in three health facilities of Ruhengeri RH, using symptoms based and chest X-ray as screening tools.

A total of 1,234 out of 3,061 (40.3%) people living with HIV in three health facilities of Ruhengeri RH zone, were screened. Among them, 10.9% (134/1,234) were presumptive TB and four 4 TB cases were diagnosed.

The TB NSP 2019-2024 approved the use of the LF-LAM technique to improve the diagnostic of TB among PLHIV and during the FY 2020-2021, we shall provide directive as well health care workers should be trained on this on this new diagnostic test.

3.4.1.3. Tuberculosis Preventive Therapy among PLHIV

Rwanda decided to resume progressively the implementation of management of latent TB among PLHIV. In November 2019, 5 district hospitals and all health centers in their respective catchment area, were enrolled and only newly tested PLHIV were eligible. Starting in July 2020, the scale up of TPT was extended to all PLHIV based on the available TPT drugs.

In May 2020, new the TB NSP 2019-2024 was released and adopted the expansion TPT to all PLHIV. During this fiscal year 2020-2021, the scale up of TPT was made in 2 additional districts, which are Kicukiro and Nyarugenge.

From July 2020 to June 2021, 233,737 PLHIV were received in ART service for routine consultation. Among them, 93% (216,876/233,737) were screened and 1.9% (4,410/216,876) were screened positive. For those screened positive 83% (3,658/4,410) performed GeneXpert and 208 PLHIV were confirmed TB cases, including 11 clinically diagnosed.

During the FY 2020-2021, the number of PLHIV who were initiated on TPT are 52,253, that represents only 25.3% (52,253 out of 206,442). This denominator of the FY 2020-2021 is the deduction of the total number of PLHIV and 854 initiated on TPT up to end June 2020. The cumulative number of PLHIV initiated on TPT since its implementation is 53,107 which represents 25.6% (53,107/207,296).

The expected number of PLHIV to be initiated on TPT during the FY 2020-2021, was not reached due to the delay of TPT drugs shipment. Another reason we may assume, is that the plan of shifting to 3HP regimen as expected, didn't go well as the manufacturer reduced his production of 3HP and Rwanda was communicated that it couldn't get this FDC before November 2021.

Table 15: Initiation of PLHIV on Tuberculosis preventive therapy, July 2020-June 21.

No		**< 15 yrs**		**>=15 yrs**		
		M	**F**	**M**	**F**	**Total**
1	Number of PLHIV received in ART Service during the reporting period	3779	8746	79072	142140	233737
A. TB SCREENING, DIAGNOSIS AND TPT INITIATION						
I. Symptoms screening						
2	Positive	34	55	2468	1853	4410
3	Negative	3465	8368	70774	129859	212466
II. POSITIVE Symptoms screening						
4	GeneXpert diagnosis Negative	13	75	1966	1407	3461
5	GeneXpert diagnosis Positive	0	0	125	72	197
6	Chest x-ray screening Normal	9	21	340	317	687
7	Chest x-ray screening Abnomal	0	0	46	30	76
8	Diagnostic of TB among negative Xpert_Excluded TB disease	2	5	196	131	334
9	Diagnostic of TB among negative Xpert_Concluded to TB disease	0	1	19	11	31
III. Number initiated on TPT						
10	Number initiated on TPT	373	1034	17396	33450	52253

3.4.1.4. TPT outcome for PLHIV

The recording and reporting process of TPT program in PLHIV in Rwanda, is done at monthly basis. We defined that the TPT completion assessment had to be done six months after treatment initiation. Based on this definition, some people missing their TPT doses, and while recuperating those doses, at six month they may be assessed as not evaluated when being still on treatment.

The WHO released the TB Preventive Treatment handbook, when TB Program had already implemented the TPT in PLHIV. Within the handbook, it's defined that the period for assessing the TPT completion must be done based on different regimens (1HP, 3HP, 6H). This means that the period for assessing TPT completion is equal to the real duration of treatment plus its 33% of additional time.

Meaning, a person initiated on 6H, the time of assessing his outcome shall be: 6 months plus 60days (33% of 6 months), that equals to 240 days or 8 months. Within this annual report, we assessed considering the six months of TPT completion predefined, but we shall align to the WHO TPT indicator assessment frame in our next annual report.

The TPT outcome assessment considered PLHIV initiated on TPT from Nov 2019 to Dec 2020. Among 898 PLHIV initiated on TPT, 92.5% (831/898) completed treatment, 3.2% were lost to follow up, 2.7% not evaluated, 0.9% died, 0.2% were confirmed with active TB and 0.4% developed side effects to TPT drugs.

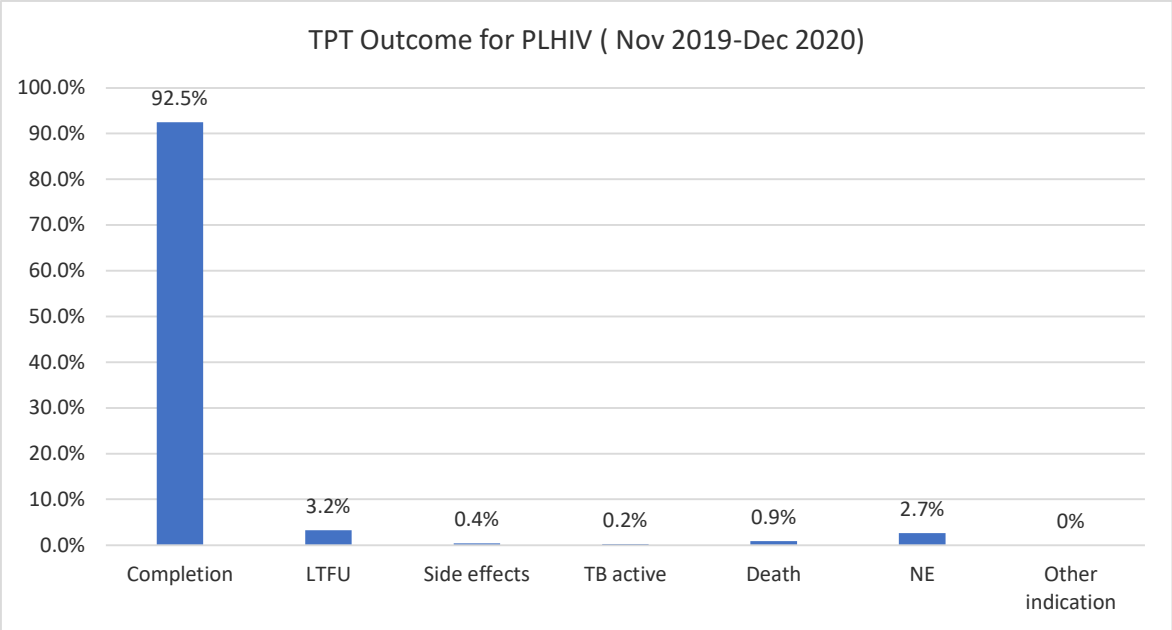

Figure 10: TPT outcome for PLHIV for the cohort Nov 2019 – Dec 2020

3.4.1.5. TB treatment outcome for PLHIV

Co-infected TB/HIV persons notified during the 2019-2020 FY were 1,143; among them 1,122 were susceptible TB.

Ninety-five percent (1,083/1,143) of co-infected TB/HIV patients started ART before the end of TB treatment.

The treatment success rate (cured or treatment completed) for all TB patients with HIV infection was 77.8% (874/1,122), death represented 14.9% (167/1,122), loss of follow up 5% (59/1,122), failed 1% (11/1,122) and not evaluated 1% (11/ 1,122).

We noted a slight decrease of the treatment success rate in PLHIV while compared to treatment success rate reached during the FY 2019-2020 (77.6%). The NSP target for this assessed FY is 81%, and many efforts are needed during coming years.

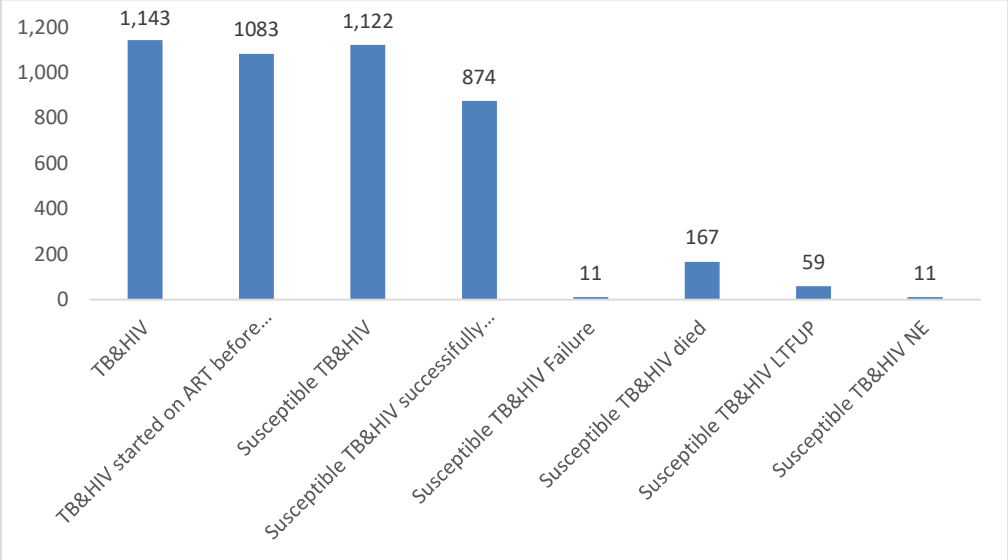

Figure 11: Treatment outcome of TB/HIV co-infected

3.4.2. Tuberculosis and Diabetes

In collaboration with NCD divisions and Rwanda Diabetic Associations (RDA), supervision has been conducted in 3 health facilities (Ruhengeri RH, Rwamagana PH and RDA clinic). The supervision was done from 04th to 10th May 2021, and we conducted TB screening among diabetic patients.

In total, 74 forms using symptom-based screening were completed and analyzed in 3 facilities visited and diabetics patients who were presumptive TB provided sputum for GeneXpert. The findings showed that diabetic patients with presumptive TB were 6.7% (5/74) and any TB case was found. However, this doesn't show the real figure of TB and diabetes co-infection due to the small number of diabetic patients screened. To improve the screening among diabetic patients, following recommendations were made:

- Integration of TB screening in National NCD Electronic Medical Records (open MRS and open clinic)/hospitals and hard copies files/health centers.
- Conduction of a regular monitoring of this integration by analyzing data from RHMIS

Key results:

Indicator	Target 2020-2021	Results
Treatment success rate among HIV positive TB cases	81%	77.9% (874/1,122)
LTBI treatment coverage among PLHIV	22%	25.6% (53,107/207,296)
Proportion of TB-HIV on ART at the end of TB treatment	93.5%	94.8% (1,083/1,143)
Proportion of diabetes patients screened for TB	TBD	Not yet started

3.5. Promote intensified screening and diagnosis of high-risk group (HRG) populations

3.5.1. TB screening and diagnosis among high risk groups

Overall, two thousand nine hundred and four (2,903) TB cases were confirmed among people at higher risk of TB, representing 53.4% of 5,435 all TB cases. The 2019-2024 TB NSP target is at ≥53% for 2020-2021 FY.

Table 16: Summary result of TB screening and diagnostic among selected HRG, July 2020-June21.

Risk group	Screened	Presumptive TB	TB Cases	%
New Prisoners admitted in prisons during the reported quarter	18904	570	741	13.6%
Prisoners at the end of the quarter before the reported quarter	165907	13650		
Contacts of TPB+ ≥ 5 years (of cases registered during the evaluated quarter)	15902	3565	357	6.6%
Contacts of TPB+ < 5 years (of cases registered during the evaluated quarter)	1297	152		
HIV+ persons (exclude prisoners, contacts, children <15 years, elderly≥55 years	563723	16223	724	13.3%
Children < 15 years (exclude children prisoners, children contacts)	1430737	19033	308	5.7%
Elderly≥55 years (exclude prisoners ≥55 years and contacts ≥55 years	1021858	48018	773	14.2%

Source DHIS2 (R-HMIS&TB case surveillance)

3.5.2. Active case finding using mobile X-ray as screening tool among high-risk group (HRG) population.

During this FY 2020-2021, active case finding (ACF) was conducted in Rwamagana prison, Ruhengeri referral hospital and three HCs in its catchment area for PLHIV, and among youth in rehabilitation transit (Kigali Rehabilitation center).

3.5.2.1. TB screening and diagnosis among prisoners.

A total of 9,971 out of 14,191 (70.3%) prisoners of Rwamagana Prison were screened for Pulmonary Tuberculosis using symptomatic (a cough ≥ 2 weeks) and chest x-ray screening. Among all screened for TB, 1,985 (19.9%) were presumptive TB; 793 (39.9%) were presumptive TB by chest x-ray suggestive of TB without TB symptoms and 1,985 (60.1%) were presumptive TB by both symptoms and chest x-rays suggestive TB.

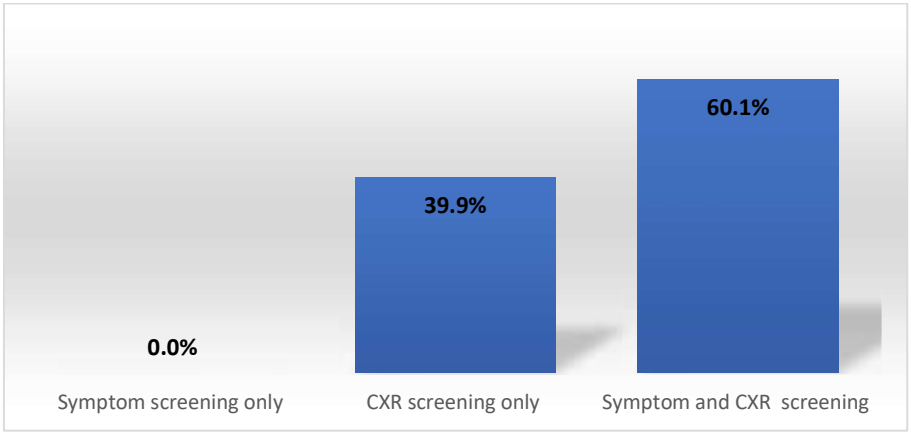

Figure 12: Presumptive TB by screening method among prisoners during 2020-2021 FY

A total of 192 new TPB+ (including 1 MDR TB case) were detected in Rwamagana Prison. All TB notified cases were from presumptive TB with chest x-ray suggestive of TB with TB symptoms or not. The added value of chest x-ray screening in all detected TB cases is at 23% (see details in fig below) and the average TB case notification rate is 1,353 per 100,000 populations. This rate was highly increased in comparison to the second (409 per 100,000 populations) and first round (964 per 100,000 populations) of TB screening in Rwamagana Prison probably due to an increasing number of prison inmates and difficulty to implement TB IC measures.

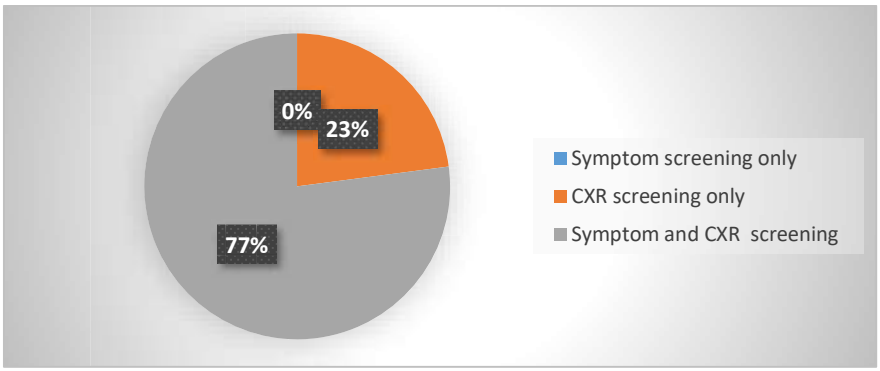

Figure 13: Added value of chest x-ray screening during 2020-2021 FY

3.5.2.2. TB screening and diagnosis among youth in rehabilitation centers

Youth in the Kigali transit center were screened for pulmonary tuberculosis using symptoms (a cough ≥ 2 weeks) with or not chest X-ray as a TB screening tool from October 2020 to April 2021. Among them, 2.6% (97/3,712) were presumptive of TB.

Six TB cases were diagnosed and started treatment. See the following table for more details:

Table 17: TB active screening cascade among youth in transit centers, July 2020-June 2021.

Kigali TC	Total screened	Total screened positive	Total TB cases
October, from 14th to 20th 2020	902	18 (1.9%)	0
January 2021 (one day: 12th)	252	9 (3.6%)	2
March, from 18th to 26th 2021	600	24 (4.0%)	2
April, from 12th to 23rd, 2021	1958	46 (2.3%)	2
Total	**3712**	**97(2.6%)**	**6**

3.5.2.3. TB screening and diagnosis among people living with HIV

A total of 1,234 out of 3,061 (40.3%) people living with HIV in three health facilities of Ruhengeri RH zone were screened for Pulmonary Tuberculosis using symptomatic (any TB symptom) and chest x-ray screening. Among them, 10.9% (134/1,234) were presumptive TB and four (4) TB case were diagnosed.

3.5.3. TB screening and diagnosis in some TB hot spots

TB screening in Kigali hot spots was not conducted due to covid-19 pandemic but in collaboration with RBC, UC Louvain, and Savics a proposal of the survey was elaborated with the main purpose:

- to prioritize mass screening and better triage methods,
- to find more missing TB cases, early diagnosis, and treatment of patients, faster screening, and qualitative reporting,
- to save resources and improve the efficiency of CHWs.

For a better prediction of these high-risk zones and continuous feedback to improve predictions and optimization of TB active case finding activities, a digital tool MediScout will be used in order to validate and optimize the developments already carried out. The activity will take place in early July 2021 in seven sites of the City of Kigali, namely Kimisagara, Rwezamenyo, Nyakabanda, Nyarugenge, Kimironko, Remera, and Niboyi Sectors.

Key results:

Indicator	Target 2020-2021	Results
Proportion of TB cases notified among high-risk groups (disaggregated per HRG)	≥53%	53.4% (2093/5435)

3.6. Ensuring diagnosis and management of Lung health diseases

3.6.1. Management of practical approach for lung diseases (PAL)

As planned in the action plan 2020-2021 FY, a second assessment was carried out in 118 health facilities by a team of 14 clinicians from hospitals, to determine the current level of application of the PAL strategy in health facilities and check the trend compared to the assessment for the year 2017.

The result of this second assessment revealed that availability of PAL guideline was 65.4% and 78.6% in health centers and hospitals respectively. Even if more than half (66.9%) of staff have been trained but few of them know the objectives of the PAL. Only 29.3% and 50% of staff working at OPD are fully aware of the PAL objectives in health centers and hospitals respectively.

Regarding the actual management of patients with respiratory symptoms, we limited to categorizing patients according to both national and international standards and the availability of recommended drugs. One third (31%) of pneumonia cases and 27% of asthma are well categorized at health centers while at hospitals are 46% and 26% for pneumonia and asthma respectively. There is need to improve compliance to protocol in order to improve management of these diseases and contribute to fight misuse of antibiotics. Regarding the availability of anti-inflammatory drugs, they were found in 12.6% of health centers and 60% at hospitals visited, a low availability proportion of these drugs, what can impact in management of patients.

Comparing the two assessments done, as shown in table below we observed a good improvement in availability of PAL guide from 9% in 2017 to 66% but a slight increase in knowledge of PAL objectives from 6% to 27% over the same period mentioned above mainly due to mobility of staff.

Table 18: Comparisons of two assessment done in area of availability and knowledge of PAL

Type of Health Facility	**First assessment done in 2017**			**Second assessment done in 2017**		
	N	**Yes**	**%**	**N**	**Yes**	
Availability of PAL guidelines						
Health Center	87	6	7%	103	67	65%
Hospital	26	4	15%	15	11	73%
Sub total	113	10	9%	118	78	66%
Knowledge of PAL objectives						
Health Center	116	5	4%	135	35	26%
Hospital	34	4	12%	17	6	35%
Sub total	150	9	6%	152	41	27%

Based on the result of this assessment, in collaboration with a team of NCDs division, we agreed and developed a document to integrate the screening of tuberculosis in OPD tools used. The remaining steps are validation of tools and integration in RHMIS for reporting by health facilities, and we have worked on a document that can help in in asthmatics and COPD cases.

Key results:

Indicator	Target 2020-2021	Results
Proportion of first level health facilities that have at least one staff trained to provide PAL services	20%	66.9% (79/118)

4. PROGRAMMATIC MANAGEMENT, MULTI-SECTORAL COLLABORATION & ENGAGING ALL CARE PROVIDERS

4.1. Introduction

This strategic objective has 5 key interventions which are:

- Political commitment with adequate resources for TB care and prevention with aim to advocate for increasing the domestic funding to cover gaps in human resource development, renovation of infrastructures and strengthening community-based initiatives. This needs high-level political commitment and effective coordination across government ministries as well as engagement and collaboration with international partners, communities, civil society and all public and private care providers.
- Management of TB care and prevention with aim to establish a program with solid leadership structures, skilled human resources and improve integration and collaboration with other programs like MCH, HIV, NCDs, etc… Also, to avail policy documents and guidelines for TB control that are consistent with global guidance.
- Engagement of communities, civil society organizations, and public and private care providers with aim to involve community through civil society in sensitization and bring service close to community to improve notification by collaborating with private sectors.
- Migrant and cross border with aim to improve surveillance because Rwanda is surrounded by some high TB burden country and improve access to refugee people.
- TB infection prevention & control with aim to reinforce measure to prevent contamination of HFs client and HCP by improving measure to reduce contamination risk for airborne diseases.

The sections below highlight the achievement of the above-mentioned interventions.

4.2. Management of tuberculosis care and prevention

4.2.1. Capacity building of health care provider on TB care and prevention management

The following provides the description of summarized topics covered and recommendations developed for post capacity building.

Table 19: list of topics covered for capacity building, July 2020-June21.

Type	Topic	Observation
Mentorship	Mentorship on TB death audit in district with poor treatment outcome	this mentorship was conducted in health facilities of 16 districts (Gasabo, Kicukiro, Huye, Rwamagana, Rubavu, Ngoma, Nyanza, Ruhango, Nyabihu, Musanze, Rusizi, Rulindo, Gisagara, Nyamasheke, Karongi and Kayonza) from 27 July to 07 august 2020,16 up to 20 November 2020,07 up to 12 February 2021 and 29 March up to 02 April 2021. With the support of TB staff at central level in collaboration with Internists TB experts, health care providers are mentored how they analyse poor outcomes and propose strategies to improve outcome of TB patients.
Workshop	Workshop with all hospitals to monitor progress of TB death audit outcome	this workshop was held from 18-21 August 2020 with participation of 51 Nurses TB focal persons, TB supervisors and medical doctors to share best practice and enhance their knowledge to improve their capacity on how to fill and interpret findings from the death audit form. In addition, we took this opportunity to update participants on new directive and share findings from different supervision conducted by the central level
Training	Training for nurses on TB, TB/HIV, MDR-TB, PAL and leprosy diagnosis and management	training for health care providers from the 3 New district hospitals which are Gatunda, Gatonde and Nyarugenge and new staff from 112 health facilities not yet trained on TB and EPTB management based on our training database and findings from mentorships reports conducted by TB&ORD Division has been conducted from 17 up to 21 May 2021. In total 142 health care providers were trained on management of TB, update on TB new directives and other respiratory diseases.

Training	Initial training for Medical Doctors on TB, TB/HIV, PAL and MDR-TB management	In collaboration with Specialist expert in TB and UR lecturers, TB division trained 41 MDs countrywide. They have been updated on new tools used in Rwanda, TB & MDR TB management, TB HIV coinfection, PAL management and new laboratory technics used to diagnosis TB in Rwanda. -During this training medical doctors were trained on EPTB management as the difficulty in establishing a definitive diagnosis remain the problem, it requires a high index of suspicion, delayed diagnosis of extra pulmonary forms is frequent and it is responsible for an increased morbidity and mortality.
Training	Practical training on abdominal ultrasound in TB case findings.	In collaboration with UR lecturers, TB Division trained 30 Internist specialists and 3 Medical Doctors on an introductory course on abdominal ultrasound in the diagnosis of extra pulmonary TB from 31 May to 11 June 2021. They had 3 days of practice at Ruhengeri RH
Training	Training of trainers on leprosy management	Participants came from all units of the TB Division as well as provincial TB coordinators and leprosy supervisors from endemic districts. Out of 30 people expected 25 attended. Several aspects were addressed as reflected as planned in the agenda. However, the aspect of presumption and early detection was interesting for the participants. Indeed, it has been reminded to think about the leprosy during consultation which will facilitate to presume and detect for early treatment. We also insisted on early initiation of treatment which prevent the leprosy reactions which are responsible for disability.
Workshop	workshop on TB infection control for health care providers	179 Nurses focal points from Eastern and western provinces health facilities were trained on TB IC measures and how to develop TB IC plan

Supervision	Quarterly supervision on TB diabetes collaborative activities	TB&ORD and NCD divisions under RBC in collaboration with Rwanda diabetic associations (RDA) has organized a field visit from 04th May to 10th May 2021 in Ruhengeri RH, Rwamagana PH and RDA Clinic to carry out an assessment on holistic management of diabetic patients in health facilities. We have proposed the right part for integration of TB screening in routine diabetes management and way forwards for this activity.
Mentorship	Mentorship to support childhood TB/HIV management at decentralized level	In collaboration with paediatrician, Childhood TB mentorship has been conducted in 6 hospitals; Kirehe, Kigeme, Munini, Butaro, Remera – Rukoma and Kibogora with also the selected HCs in their catchment area to improve the diagnostic of TB among children from 10th up to 14th May 2021. During the mentorship MDs, nurses and nutritionists at health facilities visited are equipped with knowledge to improve TB childhood diagnostic
Meeting	Childhood TB TWG meeting.	RBC/TB&ORD Division in collaboration with partners has organized Childhood TB TWG meeting from 09th up to 11th June 2021 for discussing the key achievements, challenges way forward for childhood TB management. During this meeting the checklist for childhood TB mentorship used by Paediatricians and the format report and supervision used by nutritionists were updated.
Workshop	Workshop with IMCI national trainers on childhood TB management	TB&ORD division in collaboration with MCCH Division has organized a workshop from 31st May to 04th June 2021 with IMCI national trainers on Childhood TB-HIV management. We have prepared IMCI National trainers for early childhood TB diagnosis via TB presentations, discussions and Practical sessions. During TST practical work, TB screening among children at Ruhengeri referral hospital and Muhoza health center and the TST results interpretation revealed that 3 over 8 presumptive children have shown TB positive. 3 children were started immediately TB treatment

Mentorship	FNA mentorship	RBC/TB&ORD Division in collaboration with Rwanda Society of Pathologist has organized FNA mentorship from 07th up to 11th June 2021 in 18 hospitals which are Murunda, Kabaya, Kabgayi Nyagatare, Gatunda, Gahini, Rwinkwavu, Kabutare, Munini, Gakoma, Kibilizi, Kaduha, Ruhango, Gitwe, Mugonero, Kibogora, Gihundwe, and Mibilizi. During this activity a total of 218 staff have been trained: 65 Medical Doctors, 50 Laboratory technicians and 103 Nurses. In Western province, 19 medical doctors have been trained. In Eastern province, 14 Medical Doctors have been trained. In Southern province, 32 medical doctors have been trained. The mentees have performed a total of 29 FNA for suspected cases of TB: 8 in Eastern Province, 9 in Western Province, and 12 in Southern Province. For all cases, auramine stain and GeneXpert have been performed for TB diagnosis
	TPT training	For end June 2021, 1,711 health care providers trained for all health facilities were trained on TB with emphasis on TPT. Prior to the effective implementation, a training was conducted with the following objectives: ✓ To explain the new approach of TPT among PLHIV ✓ To improve knowledge of health care providers on TB and HIV ✓ To give basic knowledge on TPT strategy ✓ To improve M&E system
Mentorship	TPT mentorship	To improve knowledge of health care providers on TB and HIV, to ensure the proper implementation of the strategy of TPT and to improve the M&E system, a regular (quarterly basis) mentorship session of all health providers has been conducted during the 2020-2021 Fiscal year in six DH catchment area.

4.2.2. Technical assistance for TB and other respiratory diseases

During this fiscal year 2020-2021, the TB division received technical assistance from the World Health Organization, mainly on the development of guidelines on management of TB, latent TB and adverse events.

Following are areas of technical support:

- We developed a Tuberculosis handbook which intends to provide guidance to professional health care workers on the management of people with tuberculosis as well as those co-infected with HIV. The development of these guidelines has been collaboration and contribution of different actors, partners and medical doctors working in referral and district hospitals
- Programmatic management of drugs resistant tuberculosis: it has been developed for use by health care providers involved in the management of DR-TB patients to ensure early detection and standardized treatment. It replaces the version updated in 2012 and was enriched with the experience of 12 years of managing the MDR-TB in Rwanda, it incorporates the new evidence policy published in WHO treatment guidelines for drug resistance tuberculosis 2019 and 2020 update versions. It also considers the End TB strategy to ensure universal access to drug susceptibility testing for the first- and second-line anti TB drugs, use of the new molecular technologies like GeneXpert and introduction of new and repurposed anti TB drugs.
- Tuberculosis preventive treatment guidelines: it is to provide evidence-based recommendations for the management of persons with latent TB infection, based on WHO's most recent guidelines1, the tuberculosis and lung diseases national strategic plan2, HIV and adapted to the local epidemiology and context, availability of resources and health infrastructure. This is the first guideline on TPT.

Key results:

Indicator	Target 2019-2020	Results
Proportion of public health facilities where at least one staff has participated in training on TB during the evaluated years	100%	100% (573/573)

[1] WHO consolidated guidelines on tuberculosis. Module 1: prevention – tuberculosis preventive treatment. Geneva: World Health Organization; 2020. Licence: CC BY-NC-SA 3.0. Accessed at https://www.who.int/publications-detail/who-consolidated-guidelines-on-tuberculosis-module-1-prevention-tuberculosis-preventive-treatment

[2] Rwanda biomedical center – IHDPC: Tuberculsosis and lung disease national strategic plan 2019-2024

4.3. Engagement of communities, civil society organizations, and public and private care providers

4.3.1. Community engagement

During the FY 2020 – 2021, the contribution of Community Health Workers (CHWs), in TB cases detection is 26.3% (1,432/5,435). The target is 25% and TB Program acknowledge the great achievement of CHWs in TB detection, compared to the previous FY 2019-2020 while CHWs' contribution was 16.4%. This may be explained to the good documentation in e-TB, health care providers taking attention and consideration while filling this information from different TB data sources (TB lab register, Bon de labo and TB case register) and CHWs involvement.

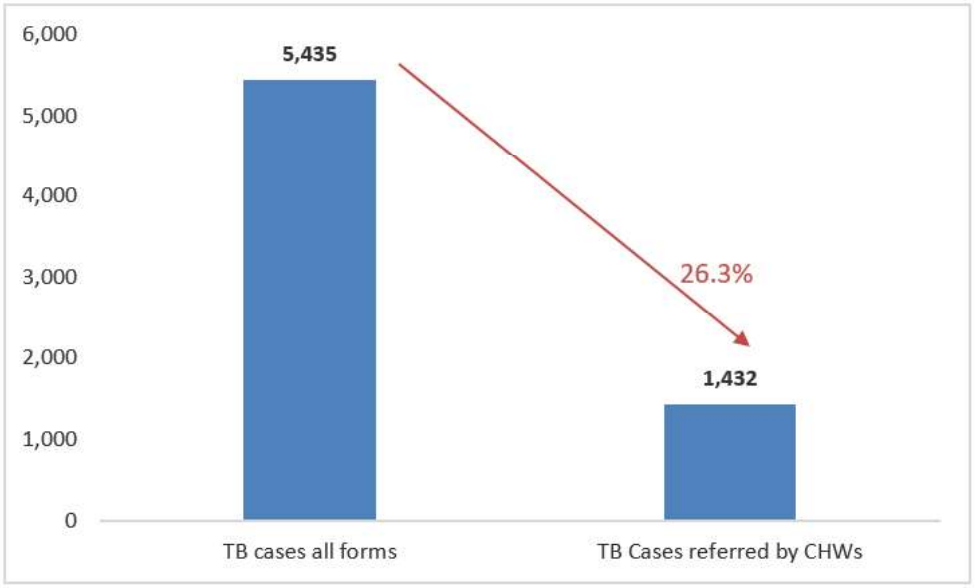

Figure 14: Contribution of CHWs in TB cases detection in Rwanda, July 2020-June 2021

4.3.2. Civils society organization contribution

4.3.2.1. Rwanda network of People Living with HIV (RRP+)

This fiscal year 2020-2021, peer educators through RRP + continued to follow their group members although there were obstacles related to COVID-19. They raised awareness within their support groups, made home visits and referred clients in need to health facilities. They are still waiting for the counter-referral forms for presumptive TB cases referred by peer educators and the result of the referral.

For TB response, RRP+ with its 16,226 Peer educators, they followed 158.666 clients during the FY 2020-2021.

Those peer educators must conduct the community sensitization on TB and HIV prevention and refer the presumptive TB at the health facilities investigation and treatment.

The education sessions are focused on TB symptoms, TB-HIV prevention and COVID-19 prevention. Complying with COVID-19 prevention measures, group sessions have been conducted at the health facilities level at the time of ART drugs pick up and social distancing observed. The participation rate of clients in group sessions was 65% (103,133/ 158,666) and 85,000 were visited: 70% of clients in unstable category and 30% of clients in stable category.

During the home visit, the peer educators assessed the cases which need clinical support and link them with the health facility for care. During the FY 2020- 2021, 58,243 clients have been referred to the health facilities for TB services and among them 55,000 clients have been referred for TB prevention Therapy (TPT).

4.3.2.2. National Youth Council (NYC)

In the community, IEC was especially oriented to youth in schools where the crowding settings may easily spread mycobacterium tuberculosis. A total number of 120 secondary schools were sensitized on TB prevention and the screening was directly conducted in groups. The sensitization sessions were done in collaboration with 28 health facilities and National Youth Council (NYC).

Among 2,347 youth sensitized on tuberculosis in IWAWA Rehabilitation Centre, 717 were screened positive, then 45 were tested by GeneXpert, 32 by chest X-ray and 640 by microscopy. No TB case was notified.

4.4.3. Contribution of private health care on TB management

Private sector engagement needs to be urgently expanded to reach End TB strategy. Engaging private health facility is also essential for reducing the missing TB cases gap. The TB program must collaborate with private health facilities, for accelerating their fully engagement in TB detection and management. The program is committed as well to increase the number of private health clinics as CDT and CT when meeting predefined criteria. Currently there are three private clinics working as center for diagnostic and treatment, and they contributed to 0.23% (13/5,438) of TB cases nationwide.

During this FY, another private clinic (OIM) was accredited as a center of diagnostic and treatment. But it has not yet started reporting in the TB&ORD surveillance system. The TB Program shall plan a special mentorship and orient them on the TB reporting tools.

Key results:

Indicator	Target 2020-2021	Results
Proportion of people with TB referred by community health volunteers	≥25%	26.3% (1,432/5,435)
Number of private clinics engaged to provide comprehensive TB services	10	3
Proportion of TB notifications contribution by private clinics	3%	0.23% (13/5,435)

4.4. Migrant and cross boarder

4.4.1. TB Prevention and care among migrants

With the aim of reducing the mortality and morbidity rate of tuberculosis in the community residing in refugee camps, the TB & ORD Division in collaboration with District Hospitals organized and conducted a sensitization campaign on the prevention, detection and management of tuberculosis and leprosy for community health workers from refugee camps.
The cumulative number of community health workers that were trained on TB prevention, symptoms and screening reached 437 out of 445 expected, that represent 98.2%.

Apart the TB sensitization done in all refugee's camps, immigrants that enter Rwanda they undergo a systematic screening for different diseases (NCDs, viral hepatitis, etc) and tuberculosis disease included.

Rwanda received immigrants from Libya and they were accommodated in Bugesera District/Gashora. The screening activity for immigrants, was conducted by UNHCR Rwanda, AHA Rwanda clinic jointly with Nyamata District Hospital and Gashora health center. The routine TB data from Gashora refugee camp, are reported through Gashora health center.

During the FY 2020-2021, 190 refugees from Libya entered Rwanda: 79 refugees entered on 21st November 2020 and 111 on 30th December 2020. While they underwent for systematic screening, 4 TB patients were identifying being already on anti-tuberculosis drugs, and no TB presumptive was found. Those refugees identifying as TB patient cases, were immediately enrolled and followed for the directly observed therapy.

4.5. TB infection prevention & control (IPC)

4.5.1. TB infection control measures at health facilities

A tuberculosis (TB) infection control plan is part of a general infection control program designed to ensure the following:

- Prompt detection of infectious TB patients,
- Airborne precautions,
- Treatment of people confirmed with TB disease.

The Rwanda TB&ORD surveillance system, an electronic based system capturing at quarterly basis the effective compliance of the implementation of TB prevention measures at health facility level, methodologically health centers are assessed by hospitals and hospitals are assessed by the central level.

The minimum package of TB infection control includes six basics measures: the existence of the IC plan, appointment of the TB focal point, Health workers trained on TB, cough Triage system and separation of coughers, IEC on the cough hygiene, doors and windows opened in service at risk.

According to TB&ORD surveillance, the health facilities that were applying all six basics measures, were 89% (508/573) for the last quarter of the 2020-2021 FY (April-June 2021).

The following sub-Districts were identified with a low performance in the implementation of the six basics TB infection control measures: Kibagabaga sub-District (52%), Kibuye sub-District (62%), Kirehe sub-District 68%, Kabaya sub-District (70%) and Nyarugenge sub-District (70%). A special attention should be considered to these specific sub-Districts, for reminding them consequences that may eventually occur once not effectively applying the basic TB IC measures.

The prevention of disease should be among the TB program frontline defenses to avoid transmission and exposure risk at HFs. The hospital should understand the importance of applying TB infection control measures to protect their staff and other persons.

4.5.2. Screening among Health Facility Staff and Community Health Workers (CHWs)

Health facility staff are at an increased risk of acquiring Tuberculosis compared to the general population.
Rwanda Health Facilities conducts a systematic TB screening once a year, for their respective health care providers as well as community health workers (CHWs) in their catchment area.
During the fiscal year 2020- 2021, 83% (21,691/26,037) of health facility staff were screened and 2% (383/21,691) were identified as presumptive TB and 4 were confirmed as TB cases.
For community health workers (CHWs), 87% (48,999/56,128) were screened and 2% (904/48,999) were found presumptive TB and only 1 TB case was confirmed among them.

The TB screening among the frontlines workers has increased for health care providers while for CHWs it did not change, compared to the previous FY: 80% and 87% respectively for health facility staff and community health workers.

Comparing to the previous FY, we observed a decrease of TB cases among health care workers, where TB cases notified during 2019-2020 being 7 cases.

Table 20: Screening of health care providers per province, July 2020-June 21.

Province	Category (Staff/CHWs)	Number	Screened		TB Presumptive		TB cases
		#	#	%	#	%	#
East	Health Facility Staff	5473	4402	80%	74	2%	0
	Community health Workers	14286	11281	79%	162	1%	0
Kigali	Health Facility Staff	5016	2839	57%	128	5%	1
	Community health Workers	3639	3240	89%	157	5%	0
North	Health Facility Staff	4225	4018	95%	28	1%	2
	Community health Workers	10774	9808	91%	175	2%	1
South	Health Facility Staff	5961	5321	89%	70	1%	1
	Community health Workers	13958	12863	92%	188	1%	0
West	Health Facility Staff	5362	5111	95%	83	2%	0
	Community health Workers	13471	11807	88%	222	2%	0
Rwanda	Health Facility Staff	26037	21691	83%	383	2%	4
	Community health Workers	56128	48999	87%	904	2%	1

Key results:

Indicator	**Target 2020-2021**	**Results**
Proportion of HCWs screened for TB	78.5%	83% (21,691/26,037)
Proportion of health facilities applying basic TB IPC measures	85%	89%

5. UNIVERSAL HEALTH COVERAGE, SOCIAL PROTECTION, HUMAN RIGHTS & GENDER, NUTRITION

5.1. Introduction

This strategic objective has 3 key interventions which are:

- Universal Health Coverage and social protection with aim to reduce TB catastrophic cost faced by TB patient and family's and advocate for policies and plan to include TB patients and cost in social protection scheme because

currently access to care is free of charge and subside by partners and government.

- Human right and gender with aim combat TB stigma and to eliminate and rectify all inequalities due to gender causing inequitable health outcomes for poor or marginalized parts of the population.
- Social Protection and Nutrition: this intervention will help to improve TB treatment outcome by advocating for nutrition support to all TB patients with malnutrition. Malnutrition is leading the socio determinant factor for TB patient in Rwanda, and this was observed by the result of verbal death audit which showed that2/3 of deeded TB patients were malnourished.

The sections below highlight the achievement of the above-mentioned interventions.

5.2. Universal Health Coverage and social protection

The Government of Rwanda has made significant efforts to develop its Health care system at the National and community levels and making it possible for most people in the country to access affordable Health care.

In Rwanda, all Tuberculosis related services are free of charge. For all presumptive TB patients, the whole flow of TB diagnosis as well as treatment are being provided freely. For sustainability of the program and mobilization to increase the domestic financing, following strategies are proposed:

- Advocate TB diagnosis and control (Laboratory tests, chest X Ray, Abdominal ultrasound, …) for being covered by Insurances Health schemes in Rwanda, to reduce financial barriers to accessing care and minimize the adverse socio-economic impact of TB,
- Strengthening the collaboration between the Ministry of Health and the Ministry of Local Government, for a special consideration of TB patients within the ubudehe cluster 1
- Creating a charity fund for TB Patients

Key results:

Indicator	Target 2019-2020	Results
Percentage of people diagnosed with TB who report stigma in health care settings that inhibited them from seeking and accessing TB services	TBD	NA
Percentage of people diagnosed with TB who report stigma in community settings that inhibited them from seeking and accessing TB services	TBD	NA

5.3. Social Protection and patient support

The TB&ORD Division in collaboration with different stakeholders, has been ensuring psycho-emotional and financial support to all MDR-TB patients diagnosed and treated in Rwanda from July 2019 to June 2020 period. The trend of the component related to the BMI monitoring for susceptible TB patients and nutritional support, newly introduced in this fiscal year will be established in the next year.

Individual counseling after MDR-TB diagnosis includes health education on the disease, possibility of treatment, duration of treatment and the mode of treatment. The patient is advised to begin treatment as soon as possible. Upon entering the MDR-TB center at district level, another individual counseling session is organized. During hospitalization at the MDR-TB center, group counseling led by an MDR-TB psychologist or one of the nurses is carried out weekly. During ambulatory care, the health center providing DOT is mainly responsible for counseling and treatment follow up.

Hospitalization, clinical exams, drugs, food, and hygiene materials are given to patients during hospitalization.

During ambulatory treatment, patients are provided with drugs, clinical exams, free medical insurance (that covers all medical costs, including 90% of costs for family members), transportation fees and nutritional support (food packages).

Twenty-six admitted new DR-TB patients at Kabutare and Kibagabaga MDR-TB centres and sixty-two patients on ambulatory treatment mode have been provided with support for nutrition in their respective health facilities. Therefore, fourty-nine health facilities with MDR-TB patients as well as two MDR-TB wards (Kabutare and Kibagabaga) have benefited MDR-TB financial support equivalent to eighty-seven million one hundred twenty-four thousand and six hundred and twenty Rwandan francs (87,124,620 Rwf).

Key results:

Indicator	Target 2020-2021	Results
Proportion of eligible malnourished DS-TB patients (BMI<18.5) who have accessed appropriate nutrition support	60%	41.7% (1082/2597)

6. STABLE AND QUALITY ASSURED SUPPLY OF DRUGS, DIAGNOSTICS AND COMMODITIES

6.1. Introduction

This strategic objective has 2 key interventions which are:

- Supply chain management with aim to ensure an uninterrupted supply of high-quality and affordable, first and second-line anti-TB drugs for all people with TB.
- Rational use of medicine with aim to monitor quality of medicines by procuring through WHO prequalified manufacturers and improve monitor of adverse events of TB drugs

The sections below highlight the achievement of the above-mentioned interventions.

6.2. Supply chain management

6.2.1. Collaboration with stakeholders to ensure the uninterrupted supply chain of TB commodities

During the fiscal year of 2020-2021, TB&ORD Division continued working with different partners involved in TB supply chain. Country received direct technical support from Stop TB partnership/GDF through the regional technical advisor based in Kigali. TB&ORD Division is fully integrated in the Coordinated Procurement and Distribution System (CPDS) to ensure that TB national needs are timely estimated. Participation in this framework increases collaboration with other stakeholders, mainly the Global Health Supply Chain-PSM (GHSC-PSM) for the technical and finance support to conduct the quantification workshop, training on e-LMIS and for prevision of TPT products. In addition, this integration offers a number of key benefits for the parties involved in the supply chain of health products: cost saving on perdiem and lodging for key personnel who would normally be required to attend quantification exercises more than one time during the year, time saving to conduct quantification and supply planning reviews, and approval processes.

We worked closely with the UNFPA in estimation of product related to nutrition support together with HIV and MCCH Division in framework of integration and teamwork.

TB&ORD is always working with MoH, RMS Ltd and NRL to monitor regular stock level at level central.

In addition, the TB&ORD Division increases collaboration with other institutions; University of Rwanda, School of medicine and pharmacy together with NRL support development of a guideline for therapeutic Drug Monitoring of TB medicines. It has been also noted that there is a good collaboration with international organization like UNOPS and through that collaboration RBC has signed an agreement for a donation of TB pediatric second line medicines from UNOP/GDF. Also, GDF worked with the Global Fund to have assurance letter to

proceed with procurement processes and pay the invoice of medicines after delivery.

6.2.2. Forecasted accuracy of TB medicines

The analysis of forecast accuracy from July 2020 to June 2021 showed that in general the forecast accuracy is good for adults first line medicines. However, we noticed issue of DR TB notification and for FLD pediatric cases which requires to review number of expected cases and monitoring of stock level. We also highlight the issue of Rifabutin which is not available at the market as country needs are under minimum order quantity.

Table 21: Forecast accuracy of TB medicine, July 2020-June21.

Regimen	**Target in Quantification**	**Cases registered in July 2020 to June 2021**	**%**	**Comments**
Patients under first line adult medicines	5329	5139	96.4%	
Children under pediatrics formulation	463	272	58.7%	Due COVID-19, no campaign conducted for use of tuberculin to screen children with TB
Rwanda FL regimen Rifabutin Based	40	3	7.5%	This product is not available at the market as quantity needed is under minimum order quantity
Rwanda 1st line regimen Separate molecules	10	NA	NA	We cannot access consumption data for one year and we are not able to produce accurate data. However, we had a stock out of this product at central level but patient eligible received alternative by replacing with moxifloxacin or levofloxacin depending on the patient.
DR TB Cases	80	28	35%	There is issue of maintenance of GeneXpert machines. This has an impact on the diagnostic capacity

6.2.3. Procurement status of TB products at end of June 2021

The TB medicines products planned and ordered during the fiscal year 20120-2021, we received 77% of those products. We still wait to receive 10% of ordered products, 6% of planned medicines order failed and 6% of first line pediatric formulation were cancelled due to the low consumption because the estimated target was not achieved.

The transition of procurement entity agency from RBC to RMS Ltd affected the procurement of lab commodities where only 15% of products were delivered, 17% were ordered but not delivered, 57% of products under tender process, and 11% failed.

Details on procurement status of different categories of TB commodities during the reporting period, are described in the figure below.

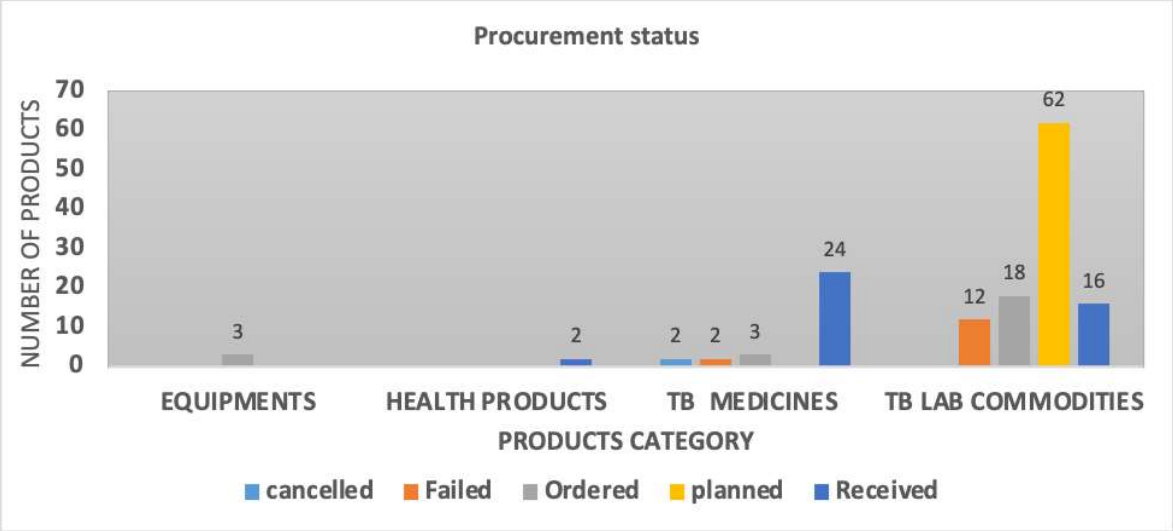

Figure 15: Procurement status of TB products, FY 2020-2021

6.2.4. Ensuring adequate quality of TB commodities

RBC through RMS Ltd received quality control results of 18 batches of 13 TB medicines from a WHO prequalified laboratory, which is ZEST LABORATORIES (P) Ltd. Most of the batches ((83%), were sampled in previous fiscal year but due to international transport restrictions caused by COVID-19, it has taken too long to reach the destination and the results were received in current reporting period. All the tests were complying with the specified standards range for the tested products.

6.2.5. Capacity building on E-LMIS

Through collaboration with GHSC-PSM, Team of Health Information System were trained on e-LMIS admin for daily management of the system. In addition, we received technical assistance of Stop TB partnership on use of QuanTB.

Notes: Even though program received capacity building in management of TB commodities, there is challenge for recruiting a new pharmacist to take over all responsibilities related to all activities of the supply chain of TB commodities.

Key results:

Indicator	Target 2020-2021	Results
Percentage of CDT with no stock out of FL tracers (RHZE and RH ad) drugs of experienced in the last 12 months	98%	*91.0% (183/201)*
Percentage of MDR TB centers with no stock out of SLD in the last 12 months	100%	100% (2/2)

6.3. Rational use of medicine

6.3.1. Implementation of TDM in Rwanda

A number of TB patients remain inadequately treated due to poor response to treatments that leads to treatment failure and subsequent death, although effective therapy has been widely implemented. The low serum concentration of anti-tuberculosis drugs has an association with treatment failure, relapse, acquired drug resistance; adjustments of drug dose after therapeutic drug monitoring have been related to clinical improvements. Thus, support was needed to monitor anti tuberculosis drug (Isoniazid, Pyrazinamide, Ethambutol and Rifampicin) levels for treatment optimization.

The RBC/TB&ORD Division in collaboration with the RBC/BIOS-NRL Division intends to start performing plasma therapeutic drug measurement of anti-TB drugs (Isoniazid, Pyrazinamide, and Rifampicin) for Rwandan TB patients in need, using the HPLC system available at NRL, as one of the tools for rapid quality service assessment of anti-TB treatment outcome.

Anti-TB (Isoniazid, Rifampicin and Pyrazinamide) HPLC-method is now available. This method intends to perform Therapeutic Drug Monitoring for TB patients presenting with positive control C2 and C5, relapse and HIV-TB coinfection. A small number of samples (18) were collected from different health centers in Kigali and were analyzed at NRL using HPLC-system. The samples were collected at two time points; early morning before the daily drug administration and 2 hours after drug administration. Preliminary data analysis is being done.

Some challenges were encountered during this exercise; some of the selected health centers did not put effort in collecting these samples. Biryogo and Remera HCs are the ones who tried to collect many. Muhima, Kibagabaga hospitals and Corrunum HC did not. Note that only five HFs were trained on this purpose, so we only expected samples from them. We were planning to train more which we did not!! We also got stock out of one of the key reagents in sample processing

(Nitrogen gas), the reason why we did not put much effort in requesting more samples to be collected since we have no way to process them.

6.3.2. Collaborative meetings on use of antibiotics (fluoroquinolones)

Antimicrobial resistance (AMR) has been a growing threat to effective treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses, and fungi.

The Rwanda Food and Drugs Authority (FDA) was established by the law N° 003/2018 of 09/02/2018 with the mandate of protecting public health through regulation of human and veterinary medicines, vaccines and other biological products, processed foods, poisons, medicated cosmetics, medical devices, household chemical substances, and tobacco products.

During the 2020-2021 fiscal year, in collaboration with the Ministry of Health, Rwanda FDA, RBC and other multisector stakeholders developed and approved the National Action Plan of Antimicrobial Resistance. The plan outlined the global five strategic objectives which will be operationalized in order to reach the desired targets of this plan. In each strategic objective, the priority actions, strategic objectives, interventions, and key activities have been identified as follow:

- ✓ Increase national awareness and understanding of AMR through education and training and good coordination:
- ✓ Strengthen the Knowledge and Evidence-Based through Surveillance and Research
- ✓ Reduce the incidence of infection through effective sanitation, hygiene, and infection prevention measures
- ✓ Optimize the Use of Antimicrobial Agents in Human, Animal and Plant Health
- ✓ Ensure sustainable investment in AMR through Sustainable and equitable financing mechanism and research and development.

Given the availability of this framework intending to optimize an effective use of antibiotics, TB&ORD Division shall emphasize especially on the misuse of fluoroquinolones in our primary health care settings. This misuse leads to huge consequences/anti tuberculosis drugs resistance, while later the patient is confirmed with TB disease.

6.3.3. Capacity building on a-DSM implementation

The a-DSM stands for the Active TB Drugs-Safety Monitoring and Management, intending to monitor patient safety and prevent, manage adverse drug reactions (ADRs), relieve patient suffering, and improve treatment outcomes.

The TB&ORD division introduced active drug safety monitoring and management (a-DSM) as standard practice and part of the recommendation of the MTR of the 2013-2018 TB NSP, to reduce risks from drug-related harm in patients. The

monitoring of a-DSM has been integrated in e-TB and RSQA check list for continuous monitoring of related indicators.

The a-DSM is mostly aimed at MDR-TB patient management with new drugs or new regimens, but it is also extended to DS-TB during clinical follow-up.

During the FY 2020-2021, no training on a-DSM was organized by the TB&ORD Division. However, it has been conducted during the previous FY prior its implementation.

The stage of "Adverse event" within the TB&ORD surveillance system/e-TB individual record, which helps to monitor whether a patient developed side effect or no to anti tuberculosis drugs, is mostly filled at the end of treatment once adverse event didn't occur. The way TB&ORD Division assesses the treatment outcome considering the cohort of TB patients initiated on treatment one year prior, the same a-DSM indicator must be evaluated. Among 5,733 TB cases drug susceptible and drug resistant registered in FY 2019-2020, 5,729 (99.9%) were reported on a-DSM and 81 (1.4%) had side effect on TB drugs. The table below shows key findings on the a-DSM indicator.

Table 22: Adverse events reported among TB cases

N=5,733 (total TB DS & DR cases registered during the FY 2019-2020)	Total reported	Percent
Reported on a-DSM	5,729	99.9%
Side effect	81	1.4%

Key results:

Indicator	Target 2020-2021	Results
Proportion of TB treatment cards where a-DSM section is completed	100%	99.9% (5,729/5,733)

7. M&E AND DATA QUALITY SYSTEM (E-TB, HEALTH INFORMATION SYSTEM, CIVIL REGISTRATION AND VITAL STATISTICS (CRVS) SYSTEM

7.1. Introduction

Proper data management associated with strong monitoring and evaluation are needed to help improve program interventions, achieve goals, and sustain funding.
This section will provide information about the status of surveillance systems used in TB control, how they work, what was done to improve their performance, current challenges, and way forward; related to the monitoring and evaluation of TB activities

in Rwanda. In additional the program will advocate for the well functionality of civil registration and vital statistics (CRVS) which is key to measure progress towards achievement of Sustainable Development Goals and avail data on underline cause of mortality.

7.2. Surveillance system including mortality registration

7.2.1. Implementation of individual case-based surveillance

The TB&ORD Division has continuously been working with its stakeholders to improve the use and performance of the TB case-based surveillance system developed under the DHIS2 platform.
Since the TB case-based surveillance system started to be used as single source of information for TB notification in July 2019, the users have enjoyed the benefits of this system but also faced and reported some issues to be fixed.

It is in this fiscal year 2020-2021 that the TB case-based surveillance system has been upgraded to version 2.35; this allowed the line listing of information from different stages/events. This was a recommendation of the users since several years because it has an advantage to facilitate analysis and data quality checking by tracking information through all the program stages from baseline to treatment outcome on a single line of each individual TB case.

Below are some issues that have been fixed during the workshop held in November 2020:

- A new data element called "*DST on culture*" was created in baseline stage and the DST stage was hidden for DS-TB.
- An auto-generated data element of "*Age*" was created from "*date of birth*".
- A new data element on "*nutritional support*" was created in treatment stage, to monitor the provision of nutrition support to the malnourished TB patients.
- The analytics was fixed to run automatically, to facilitate update of the information entered in the system.
- The data element called "*tracnet number*" was created for co-infected TB-HIV patients.
- The "*Unknown*" was removed from modality of responses of the data element called "*Site of disease*".
- The program rule was created to hide the data element called "*Number of TB contacts of TPB+ index case*" and "*Contact investigation stage*" for the clinically diagnosed TB cases.
- The data elements called "*TB Classification (DS-TB or DR-TB)*" in baseline stage and "*MDR-TB treatment Center*" in treatment stage for MDR-TB cases were created to facilitate isolation and analysis of MDR-TB cases.
- Three aggregated data set reports were customized to be automatically generated from TB case-based surveillance system:
  - ✓ *Registration of TB cases by susceptibility, age and sex*
  - ✓ *Registration of TB cases by case category, site and treatment history.*

- ✓ *HIV testing among TB cases.*
- The leprosy program was partially created in TB case-based surveillance system.

Below are pending activities and way forward:

- Data elements in Enrolment and Lab tests in baseline to be reset as mandatory.
- Finalize the customization of the remaining aggregated data set reports to be automatically generated from TB case-based surveillance system.
- Slowness of the event reports and data set reports need to be fixed to facilitate analysis and reporting.
- TB Contact tracing stage needs to be customized.
- The Leprosy program need to be finalized.
- Customize Death audit reports from TB case-based surveillance system.

Despite the efforts made by central level to improve use of TB case-based surveillance system, there still observed delay in completing all the required program stages and limited computer skills of TB focal points in the health facilities.

7.2.2. Reporting of TB

This is the second fiscal year the TB&ORD Division started reporting information related to TB notification from July 2019. Since then, the Rwanda National TB Program has phased out the aggregate reporting on TB notification in favor of the TB case-based surveillance system to make it optimized and usable. The TB treatment outcome information was still reported in both aggregate and individual systems up to June 2020 in order to have information on the TB treatment outcome of the cohort July 2018 – June 2019. During the fiscal year 2020-2021, the information regarding TB treatment outcome was ONLY reported through TB case-based surveillance system for the cohort registered in fiscal year 2019-2020. The information on TB screening and presumption is still captured in the HMIS aggregate TB quarterly report.

7.2.3. Rapid Service Quality Assessment

During fiscal year 2020-2021, two TB RSQA activities were conducted by central level staff and TB provincial coordinators. However, it was not possible to compare the findings both sessions since the approaches used were different.

- ***TB RSQA conducted from 31st August to 11th September 2020***

During this TB RSQA, the Rwanda NTP used a checklist that was updated in February 2020 based on the new protocols, guidelines and needs of the NTP program, where around 14 questions were added. A total of 60 centers of TB diagnosis and treatment

(CDTs) was visited out of 200 (30%); these health facilities are the ones that were not visited during the RSQA conducted in March 2020.

The preliminary findings show that among 17 hospital catchment areas visited, 13 had a score of at least 75% (overall average score) and 4 were below 50% score (Mugonero, Kirinda, Ruli and Nyamata). Most of the components assessed had a score above the average (75%). However, the activities regarding aDSM, monitoring of BMI and provision of nutritional support, and Leprosy control need special attention.

- ***TB RSQA conducted from 22nd February to 05th March 2021***

A new approach was used during this TB RSQA, where both CDTs and CTs were visited based on criteria set during the TB&ORD staff meeting held on 08th February 2021. A total of 101 Health Facilities was visited out of 570 (18%).

The results showed that among 21 hospital catchment areas visited, 16 had a score of at least 69% (overall average score) and 5 were below the average score of 69% (Ruhengeri, Nemba, Nyanza, Ruli and Nyagatare). Six components were below the national average score (69.4%). These are components related to a DSM, functionality of TB diagnostic system, PAL, TB Infection Control, monitoring of BMI and provision of nutritional support, and Leprosy control. These components need special attention.

7.2.4. Civil registration and vital surveillance in Rwanda

A well-functioning CRVS system provides essential data, rates and other quantitative measures for the accurate planning of programmes designed to promote the wellbeing of the citizens. The CRVS data are critical important in designing and implementation of public health measures and considered as the main sources of data for the health sector in the monitoring and evaluation of different health interventions and epidemiological studies. The CRVS system provides details of birth and death registration information with unique identification number, and mortality data used to monitor mortality indicators related to TB program to prevent premature deaths.

7.2.4.1. Key achievements of the CRVS program in Fiscal Year 2020/2021

This section explained the achievements obtained in the strengthening CRVS system in Rwanda for the period of 2020/2021 fiscal year. Deaths and causes of death registration have been very low at 30% according to vital statistics report 2020, and multiple efforts were done during this fiscal year.

The medical certification causes of death (MCCOD) and ICD-10 coding has been integrated into National Centralized integrated CRVS system to register deaths and causes of death in all health facilities. Over 1,200 health facility civil registrars and data managers were trained on new registration SOPs and digital CRVS system to register deaths and causes of death in the digital CRVS system at facility level.

Conducted quarterly MCCOD quality assessment in the public hospitals to improve the quality of causes of death reported. The quality of causes of death increased by 10% with usable causes of death.

Introduced MCCOD eLearning course to all practicing medical doctors as mandatory required CPD credits for licensure to improve the knowledge of doctors on certification of deaths when face to face training was impossible during the outbreak of COVID-19 pandemic. Over 2,000 (95%) of medical doctors enrolled in the MCCOD E-Learning course and 1,700 (81%) of medical doctors have successfully completed the course in FY 2020/2021. This will improve the quality of causes of death at national level.

Interoperability of NCI-CRVS system and HMIS system for deaths and causes of death that occur at health facilities has been completed and individual data are recorded, transmitted, and stored in the NCI-CRVS system as front-end system linked to HMIS system. The data are pulled everyone hour from NCI-CRVS system to HMIS individual records with all particulars requested by MoH including unique identification number of deceased.

Interoperability of NCI-CRVS system, VA ODK central system with WHO 2016 VA Questionnaire, OpenVA pipeline and DHIS2 was completed to allow data collection of VA interviews for community deaths. The registered deaths information in the NCI-CRVS system are pre-populated into ODK central system with Unique ID of deceased after community death registration at Cell level.

The regulation for additional registration points at health facilities and at the cell level for vital events was approved during the fiscal year 2020/2021. The presidential order no. 092/01 of 21/09/2020 determining responsibilities of the Executive secretary of the Cell was approved to allow verbal autopsy to be conducted at the cell level for community deaths.

7.2.4.2. Challenges and proposed solutions

- Death and cause of death registration completeness rate remains very low about 30% at the national level especially majority deaths occur outside health facilities and are not registered. The regulation has been approved to decentralize death registration and verbal autopsy at Cell level to improve registration completeness and availability of causes of death from the community deaths using verbal autopsy approach.

- The quality of causes of death at health facilities is relatively low and requires combined efforts for both health facility leadership and CRVS stakeholders to improve the quality of COD. The death registration also remains very low in the health facilities even though the civil registrars were all trained and the NCI-CRVS system has been deployed at all health facilities. Quarterly supervision and mentorship are required to improve the quality of COD at health facilities.

- Reporting lag for death registration has significantly increased even though the digital CRVS system has been deployed in all health facilities to allow timely notification and registration of vital events at the place of occurrence. This leads the people to face penalties for delayed and late registration. This requires regular monitoring and supervision of deaths registration in the health facilities.
- The outbreak of COVID-19 pandemic has strongly affected timely deaths and causes of death registration in the health facilities and at the community due to the movement restrictions.

Key results:

Indicator	**Target 2020-2021**	**Results *(Source: QEM)***
e-TB coverage in CDT and CT as proxy of Timeliness of routine reporting	96%	100%

8. DATA FOR PROGRAMMATIC MONITORING, EVALUATION, LEARNING AND PLANNING

8.1. Introduction

Generate data with good quality is needed to guide the decision making and very efficient for resource mobilization. This strategic intervention focuses on generate evidence-based data which helps program for prioritization and inform policy. Evidence based prioritization doesn't require a lot of data but the important question what we want to collect, up to which level and for which purpose? We developed a TB cases-based surveillance customize to respond Rwanda Needed by identifying key data which can inform the program and help for decision making because some time if many data are collected, people have trouble and difficult to analyze it. In additional the case-based surveillance allows analysis at each administrative level and data can be disaggregated by sex, district, gender etc….

8.2. Evidence generation and use of electronic data systems

8.2.1. Estimate the prevalence of multidrug resistance TB using data from individual record

A study on "Continuous surveillance of drug resistant tuberculosis burden in Rwanda" was carried out in June 2021 using case-based surveillance system. This was a retrospective cross-sectional study using one year (from 1st July 2019 to 30th June 2020) routinely collected TB data from the Rwanda TB case-based surveillance system through the DHIS2 platform. The general objective was to evaluate DR-TB continuous surveillance among newly diagnosed and previously

treated cases with bacteriologically confirmed pulmonary TB in Rwanda. It had four specific objectives:
To estimate the drug susceptibility testing coverage among eligible TB cases in Rwanda.
To estimate the prevalence of rifampicin resistant or multi-drug resistant tuberculosis (RR/MDR-TB) and extensively drug resistant tuberculosis (XDR-TB) in Rwanda.
To estimate predictors of RR-TB in Rwanda.
To formulate recommendations to improve the performance of continuous drug resistance tuberculosis surveillance in Rwanda.

The results showed a very high RR-DST coverage in both new (95.7%) and previously treated (95.5%) TB cases but the second line drugs DST was done in only 65.8% (48/73), thus the prevalence of second line drug resistance among RR-TB patients was not estimated.
There was a statistically significant reduction of RR-TB prevalence from 10.7% (in 2015) to 4.9% (in 2020, p=0.04) among previously treated cases but the RR-TB prevalence in new cases was stable (1.5% in 2015 and 1.4% in 2020; p=0.81).
Twelve TB factors were studied but only three were found to be statistically associated with being diagnosed with RR-TB disease in Rwanda: history of contact with MDR-TB case (aOR=11.37, [95% CI 4.19-30.82], p<0.000), history of previous TB treatment (aOR=3.64, [95% CI 2.14-6.19], p<0.000) and living in Kigali (aOR=1.65, [95% CI 1.03-2.65], p<0.037).
Based on the findings from this study, three main recommendations to the Rwanda NTP were formulated:
periodically calculate the national DR-TB burden and use the results for policy making and the calculation of the needs for DR-TB drugs and reagents.
perform second-line DST for all RR-TB. This will allow clinicians to timely adjust second-line TB treatment to the resistance profile and also inform the NTP on the expected effectiveness of the second-line regimen in use.
besides DST for fluoroquinolone, the core drug of second-line regimens, introduce DST for new second-line drugs (Bdq-Lzd-Dlm-Cfx) in the routine testing package for patients with RR-TB as the second-line TB treatment is being modified to fit WHO 2020 guidelines.

8.2.2. Implementation progress on recommendation Epi review

Table 23: Status of recommendation made during TB epi-review October 2018.

Recommendations	Status of implementation
Finalize new eTB and set a clear objective and timeline to implement it countrywide	Done

Ensure the use of a universal unique ID for all persons in Rwanda (including <16, foreigners, prisoners, homeless) that can reliably enter in the new eTB	The unique ID is generated by NCI-CRVS system after registration of vital event. The NCI-CRVS system was launched on 10th august 2020, in order to start birth and death registration in health facilities and at the community to ensure legal identity for all. As outlined in national CRVS strategic 2017-2022, the NCI-CRVS system was introduced by the NIDA together with MINALOC and MoH as digital registration system. The interoperability of NCI-CRVS system with unique ID to HMIS/DHIS2 was completed. The TB related deaths can be accessed in the DHIS2.
Flexibility to allow a % of cases with no ID to be registered in the eTB	Done. The system is flexible and allow the inclusion and reporting of TB cases that may not have the required ID for multiple reasons.
Develop a plan for the transition and migration of data (including completing 2013 reports in HMIS)	Transition and migration of data from HMIS to DHIS2 are done. Format for data entry used in 2013 was improved to collect all needed information instead of recording data for 2013 quarters.
Continue the recording of presumptive TB to aggregated and not case-based as was done recently	Done
Medium term: consider entering close/household contacts case-based (but not at the cost of TB case reporting). Prioritize eligible IPT to follow up start, completion and effectiveness.	Integration of TB contact investigation in individual case-based system is done. People eligible for IPT are recorded and reported in the aggregated TB system (HMIS DHIS2)
Interoperate electronic systems: new eTB, HIV case base database, LIS, National Identity Agency, CRVS, among other relevant - with a unique ID	Interoperate electronic systems is under development. Up to now, the interoperability is between GeneXpert machines and electronic TB system
Increase the number of staff with full time dedication to M&E activities at national level, especially considering implementation of new eTB	Not done. No new position increased on the RBC/TB structure.
Train in data analysis and interpretation, using dashboards	Done

Analyze subnational data, per age/sex, to monitor case detection and treatment outcomes	The TB data are analyzed by district age/sex, to monitor case notification and treatment outcomes
Prioritize key indicators for data quality, in ISS&DQA and TB&ORD in meetings quarterly, document findings	ISS&DQA was not conducted this year due to outbreak of COVID 19 pandemic but in previous year, TB&ORD division updated the indicators during the ISS&DQA preparation.
Develop plan update SOP for data quality assessment of the new eTB, especially during the transition	Done. The job aid SOP using by end users (data manager) for data quality was developed and shared.
Encourage the implementation of the new CRVS to document all TB hospital and community deaths using ICD-10 codes	Partially done. The government launched National centralized integrated CRVS system on 10th August 2020 to capture births and deaths that occur in the health facilities and at the community. Currently all hospitals are certifying deaths using medical certification of causes of death (MCCOD) as recommended by WHO and reported into ICD 10 coding system in the NCI-CRVS system. The NCI-CRVS system is digital platform used to register deaths at health facilities and at the Cell level according to the law. The verbal autopsy program was introduced to capture community deaths and determine the probable causes of death using Open data kit(ODK) central system linked to NCI-CRVS system. The interoperability of NCI-CRVS system with HMIS to report deaths and causes of death at health facilities was completed in order to report accurate, reliable and timely mortality data. In addition, the interoperability of CRVS system with ODK central system, OpenVA pipeline and DHIS2 to capture deaths and causes of death at the community was completed.

Work with pediatricians and primary care physicians to improve TB diagnosis in children, especially < 5 and in Kigali	Done. Conducted workshop with pediatricians working in private clinics on how to improve TB detection among Children. TB&ORD division in collaboration with Rwanda Pediatric Association conducted every semester Mentorships at decentralized level to reinforce knowledge on diagnosis and management of childhood TB. TB&ORD division in collaboration with MCCH conducted workshop to improve knowledge of National Integrated Management Child Illness (IMCI) trainers of trainers on Childhood TB management.
Consider ACF among household contacts <5 up to 1-2 years after exposure in selected sites –especially among those not on IPT	Not done Up to now, household contact under 5 is systematically screened using symptoms-based approach and those found negative are initiated on IPT.
Ensure new eTB allows routine surveillance of drug resistance (% of rifampicin resistant among new and previously treated)	Done.
Utilize GeneXpert platforms to full capacities	In 2020-2021, 11% (7/64) GXP sites were using their GXP machines at full capacity. Some reasons are mentioned below: Some GeneXpert modules are not working in the remote facilities which affects to work on its full capacity. (Maintenance issues) Secondly, the remote health facilities have to collect samples twice a week to transport them for GeneXpert which also affect to functional on its full capacity. Covid-19 pandemic influences the health service frequentation.

Medium term: scale up Xpert MTB/RIF to all presumptive, beyond Kigali	The Xpert is done to all presumptive beyond Kigali for all PLHIV, presumptive >55ans, Prisoners, HCP, Contact of case index according to the national algorithm.
Continue efforts among PLHIV, household contacts and prisoners	Done.

9. RESEARCH PRIORITIES

9.1. Introduction

The vision of the Ministry of Health is to provide better quality health services through evidence-based policy and planning. The TB & ORD Division has responded to this vision by conducting operational research to inform TB&ORD planning, intervention and to build research capacity of the staff.

9.2. Research strengthening

9.2.1. Publications made during 2020 -2021 fiscal year

Three high impact manuscripts were published in peer reviewed journals:

1. An abstract on Risk factors associated with TB disease in patients attending health facilities in Rwanda was published in Int J of Tuberc and Lung Dis, 2020
2. Assessment of factors associated with Tobacco smoking among pulmonary TB patients attending health facilities in Rwanda, as secondary analysis Risk factors associated with TB disease in patients attending health facilities in Rwanda
3. Assessment of tuberculosis related knowledge and care-seeking behaviors among Rwandan Population: A national cross-sectional study, secondary extracted in the final database of the 2014-2015 DHS 2.

9.2.2. Studies and protocols under development this fiscal year

9.1.1. **Three Study protocol finalized but not yet implemented:**

1. Socio demographic and Clinical Risk Factors Associated with Mortality Among Clinically Diagnosed Tuberculosis Patients: Hospital-based prospective This research project is not yet implemented due to issues related an availability of funds cohort but planned in our research topic of TB&ORD NSP 2019-2024
2. All oral shorter treatment regimen for multidrug and Rifampicin resistant tuberculosis (MDR-TB): Evaluating its effectiveness, safety and impact on

the quality of life of patients in Rwanda. Protocol was developed and submitted to RBC /RIDS / MRC for review in order to get a research collaborative approval letter. Data collection is planned to be done during this fiscal year 2021-2022.

3. TB Catastrophic cost survey entitled: "An evaluation of costs borne by TB-affected households in Rwanda". This protocol has been evaluated by RIDS, NHRC /MOH, RNEC and NISR approved by RNEC and NISR. Research collaboration agreement between RBC and UR-CHMS _SPH is available. Transfer of funds by RBC/SPIU to UR –CHMS-SPH to implement this survey is already done. Data collection and reporting are planned to be done during this fiscal year 2021-2022.

Two Study protocol approved, and data collection done

1. Clinical and social long-term outcomes among multi-drug resistant tuberculosis (MDR-TB) patients who successfully completed MDR-TB treatment under the Rwanda TB program. Data cleaning, analysis and reporting are planned to be done during this fiscal year.
2. Feasibility of targeted TB active case finding in Kigali, Rwanda Last Revised - 16.03.2020 using Medi scout tool. This study has been evaluated and approved by RNEC. This study was implemented in July 2021 and data collection done in July 2021 and are available. Cleaning, analysis and reporting will be done during this fiscal year 2021-2022

Study reports finalized:

1. Risk factors associated with TB disease in patients attending health facilities

10. LEPROSY CONTROL

10.1. Introduction

Rwanda surveillance system of leprosy aimed at to reduce the leprosy burden towards elimination in Rwanda, with a target of zero children diagnosed with leprosy and visible deformities and to maintain the rate of newly diagnosed leprosy patients with visible deformities.

According to the WHO, a registration over time of less than one case per 10,000 inhabitant means elimination of leprosy, which is public health concern. Rwanda has achieved already this target of leprosy elimination and is seeking WHO- certification.

10.2. Strengthen government ownership, coordination and partnership including strengthening surveillance and health information systems.

10.2.1. Ensuring political commitment, advocacy, and resource mobilization by engaging all stakeholders for leprosy elimination.

The continuous ensuring the political commitment, advocacy are still ongoing. One of the approaches to mobilize domestic resources is to advocate at district authorities to take over some of the activities funded by partners. During this reporting fiscal year, one of our traditional on leprosy activities which was Damien foundation ended their support in December 2020.

Meeting has been organized at Nyaruguru District with administratives and health authorities to advocate for funding on active case finding as Nyaruguru is one of the leprosy endemic area. The meeting was organized on 30 March 2021 and aimed to enhance the involvement of the leaders at District level. We discussed how to strengthen leprosy surveillance and to prevent the recurrence of leprosy in the community through active case findings. Leaders committed to support leprosy activities mainly by conducting at least twice a year active case finding in collaboration with central level.

10.2.2. Strengthening surveillance and health information systems for program planning, monitoring and evaluation

10.2.2.1. Improve leprosy surveillance system

The recording and reporting system was put in place in order to enable the monitoring and evaluation of leprosy activities. The aggregated data related to leprosy are still reported through HMIS-DHS2 on quarterly basis by all health facilities countrywide. Therefore, during this reporting year, we reviewed the e-leprosy system and we observed that the contact investigation was not interconnected with index cases. In addition, the way to track, report and interconnect the contact with index cases was improved through e-leprosy system. However, the validation rules for ensuring the quality of data entered in the electronic case-based surveillance are not yet defined.
We developed and distributed leprosy screening registers in all health facilities. This new register captured the cascade of leprosy care and helps also to improve the monitoring of passive and active approaches in screening.

10.2.2.2. Improve data reporting and quality

During the quarterly evaluation, data checking of leprosy is also done to ensure the quality of data and improve the reporting even for non-endemic area. In additional all TB&ORD staff, TB provincial's coordinators and supervisors have been trained on the new reporting tools to improve data quality during the evaluation.

10.3. Stop Leprosy and its complications

10.3.1. Strengthening patient and community awareness on leprosy

10.3.1.1. Behavior change communication

During the leprosy active case finding, we conducted sensitization and education in cells and village where activities were conducted, and formers leprosy cases are participated to raise community awareness. Particularly in Nyaruguru District, all head of HF and staff in charge of IEC were skilled on leprosy symptoms, how to prevent disability and leprosy prevention during the week of launching leprosy awareness in that district. However, there was reduction of live talks aimed at increase community knowledge due to COVID-19 pandemic situation.

10.3.2. Enhancing early case detection of leprosy in the community through active case finding and contact management.

10.3.2.1. Leprosy screening and notification

We continue to conduct active case findings in endemic area to allow the leprosy diagnostic because the routine surveillance struggle to diagnostic

due lack of knowledge and mobility of trained staff. But due to covid-19 pandemic, the activities were not done as planned

During 2020-2021 FY, 9 out of 14 (64.2%) leprosy cases were detected during leprosy active case finding. Rusizi, Ngoma, Bugesera, Gisagara reported each on 2 cases of leprosy and represented the proportion of 14.2% each mentioned Districts.

In total, 14 leprosy cases were diagnosed. The proportion of MB cases represented [64.3%] while PB were [35.7.1%] and [57.1%] of cases female. The proportion of G2D among new cases is 21.4 % for MB and 0% for PB. For more detail, see the following table.

Table 24: Leprosy notification. July 2020-June 2021

LEPROSY CASES	**MB**	**PB**	**Total**
New cases (NC).			
# of new cases (NC)	9	5	14
# of children among new cases (0-14 years)	1	2	3
# of women among new cases	6	2	8
# of new cases detected during active case finding campaign	7	3	10
# of new cases evaluated for their disability at diagnosis	9	5	14
# with grade 1disabilities	0	0	0
# of children with visible deformities (G2D)	0	0	0
# of all new cases with visible deformities (G2D)	3	0	3
# of foreign born new cases notified in Rwanda for less than 15 years at the time of diagnosis	0	0	0
Retreatment cases			
# of relapses	0	0	0
# of retreatment after default	0	0	0
Total cases	9	5	14

Leprosy contact tracing was introduced in 2018 and implemented to all endemic areas but we started to report it this FY due to the fact that it was not captured in our leprosy surveillance system.

During this FY, 69 contacts of leprosy index cases were enumerated, and among them, 55% (45/69) were screened for leprosy symptoms and no presumptive cases found. But all contact will be followed up to five years due to the long incubation period of leprosy.

10.3.2.2. Trend of leprosy notification

The figure below shows, the trend of leprosy notification for 14 cases. We observed that the number of 9 with the reduction of MB compared to an increase of PB. Nevertheless, the last two fiscal years, the number of MB is higher than the PB.

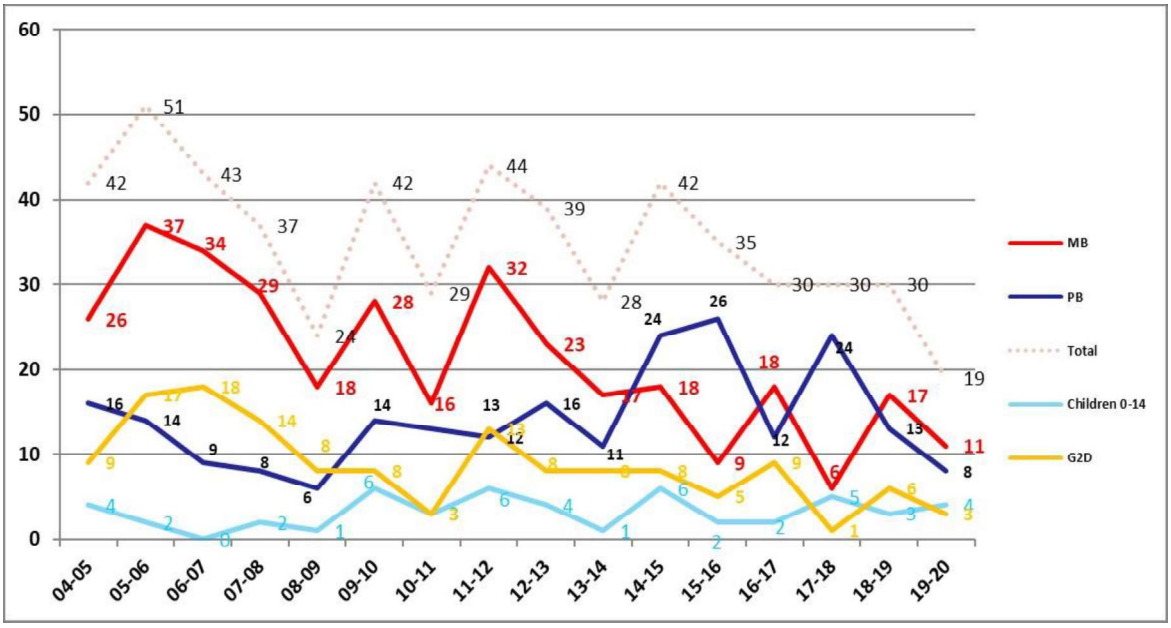

Figure 16: Trends in leprosy notification, by case category, Rwanda, July 2004 to June 2020

10.3.3. Treating all leprosy cases detected with adequate multidrug therapy (MDT)

All diagnosed patients have been treated with adequate multidrug therapy in accordance with WHO guidelines (October 2018) which recommended to administrate 3-drug MDT to Paucibacillary (PB) patients as it is indicated for multibacillary (MB).

10.3.3.1. Supply chain of leprosy drugs

We used to get multi-drug therapy (MDT) for leprosy from WHO, but the program has been informally informed about the changes on the currently supply system. Therefore, the country should secure funds to procure the MDT for leprosy.

As of end July 2021, the inventory shows a stock on hand of 52 MDT Blister packs for adults and 36 for children. They could be used for only 14 patients. Even though we roughly notified few cases of leprosy over time, our prediction based on the present cases reported this year revealed that we could face a serious problem to do not having the MDT to treat expected cases of leprosy in this coming year. So far, we are still looking forward the durable response from WHO.

10..3.3.2. Treatment outcome

The treatment success rate was 100% for both PB and MB cases recorded in the 2019-2020 and 2018-2019 fiscal years respectively.

Table 25: Leprosy treatment outcome for cohort July 2020-June 2021

Cases	**New cases**		**Relapses**		**Retreatment after default**	
	MB	**PB**	**MB**	**PB**	**MB**	**PB**
Registered	17	8	4	0	1	1
Completed Treatment	17	8	4	0	1	1
Lost to follow up	0	0	0	0	0	0
Deaths	0	1	0	0	0	0
Non evaluated	0	0	0	0	0	0
Treatment success (%)	100%	100%	100%	-	100%	100%
Number of patients having developed leprosy reactions during treatment	0	0	0	0	0	0
Number and proportion of patients assessed for disabilities at least both at the beginning and end of treatment	17	8	4	0	1	1
	100%	100%	100%	-	-	-
Number of patients having developed new disabilities during treatment	0	0	0	0	0	0

10.3.3.3. Reinforcing adherence to treatment

The regular supervision of Rifampicin directly observed monthly dose permitted to reinforce the adherence to treatment, ensure clinical follow up to monitor adverse event and early identification of leprosy reaction. Other health related problems were evaluated during the monthly visit.

Since last year, CHWs were involved in treatment follow up for some patient with adherence issue and this improve their adherence where it was observed a good treatment success which reached 100% for MB and PB followed by CHWs.

10.3.4. Strengthening prevention of disabilities and ensuring proper care.

The prevention of disabilities is resulted for different interventions, which include early detection of leprosy in the community and treatment, clinical follow up and systematic disability assessment of patient under treatment in endemic area and non- endemic area.

The overall disability assessment of new leprosy cases notified showed a coverage of 100% and none has developed new disability during the course of treatment.

In additional, TB staff, TB provincial coordinators and supervisors of endemic zones were skilled on how to perform the disability assessment and improve its reporting to cover the gap identified during the past years.

10.3.5. Ensuring capacity building of health professionals to scale up access to intervention and sustain expertise in leprosy

With the aim to ensuring a sustainable preventive and control of leprosy in endemic and non- endemic area of leprosy as set in our current developed Leprosy National Strategies Plan. Training of trainers was organized and attended by 15 staffs from TB&ORD Division, three TB Provincial Coordinator and five TB supervisors from Mibilizi DH, Gakoma DH, Kibilizi DH, Rwamagana PH and Ngoma RH at La Palisse Nyamata.
This training aimed to skilled staffs to be able to conduct active cases findings, provide leprosy treatment and conduct disability assessment in order to facilitate integration of leprosy during TB supervision and data quality audit. During this fiscal year 2021-2022, they will conduct field activities in collaboration with skills staff working in leprosy program. Particularly, the TB provincial Coordinators were called to empower health provider in their province to be able to conduct leprosy screening and improve surveillance system.

Training of trainers of TB&ORD staff, TB Provincial Coordinator and Supervisors at Hospitals in endemic area

In collaboration with MOPPD, a multisectoral approach has been discussed to fight against the Neglected Tropical Diseases, including skin disease (Podoconiosis, leprosy, scabies, etc). We developed an integrated training tools to build capacity of health providers on skins disease then improve the diagnostic and management of those skins' diseases at peripheral level.

10.4. Stop discrimination and promote socio economical inclusion.

Stopping discrimination

Use of different channels of communication like community gathering and national and local radios could increase awareness of leprosy and stigma reduction among the general population. In addition, this can also replace the persistent image of a mutilating or witchcraft like disease with that of a curable disease if diagnosed on time.

Promoting socio-economical inclusion

Across the different active case finding carried in endemic area of leprosy, we held the meeting with the former patients and their families, member of associations of Nyabitimbo HC and Gikundamvura/ Kizura to let know them about shortage of funds related to social support as they had been prepared before. Now it is time to depend on their proper project incomes and pay themselves about the CBHI.

With remained funds for support, this fiscal year we provided social support to the vulnerable people affected by leprosy. Overall, a total amount of 1,417 CBHI were provided to them, and they covered this fiscal year reported and FY 2021-2022 as well. Indeed, 478 CBHI were accounted in Gishubi, 314 in Gikundamvura, 233 in Nyabitimbo, 176 in Jarama, 156 in Nzangwa, and 60 in Bugarama. Moreover, one income generating revenue was received to one person located in Gihara/Kamonyi and four renovation houses were received fund (2 in Gikundamvura, 1 in Mareba, 1 Gisagara). All these supported were funded by Damien Foundation which ended the financial support in December 2020. There is need to advocate for local administrative to take over these activities to ensure socio economic integration of leprosy patients using different socio support provide by government.

11. FINANCE

11.1. Funding Sources for TB Expenditures in Rwanda FY 2020-2021

The Ministry of Health and the Rwanda Biomedical Center in collaboration with its partners worked on the design and development of the Health Resource Tracking Tool (HRTT), where all health sector actors (Government institutions and development partners) report on a periodic basis. The system is designed to collect expenditures and budgets on a quarterly and annual basis.
To facilitate the collection of financial information for this year's report, a separate data collection process was adopted using SMART IFMIS (Integrated Financial Management Information System) for Global Fund grant and Government contribution.

11.2. Public and external funding sources for TB NSF

The Global Fund for AIDS, TB and Malaria (GFATM) contributed USD 5 637 586; the GoR contributed USD 2 907 520; Damian Foundation contributed USD 33 007 and WHO contributed USD 65 000 to give a total budget of USD 8 643 113 for fiscal year 2020/2021.

The TB/NSP total spending amounted to USD 8 361 961 (96,7%) as follows: Global Fund spent USD 5 239 444; GoR expenditures were USD 3 024 824; Damian Foundation USD 32 693 and WHO expenditures were USD 65 000

Table 26: Contribution of Different Funding Sources for the year ended 30 June 2021

Donor	Budget in USD	Expenditures in USD	Budget execution rate in%
Damian Foundation	33 007	32 693	99,0%
Global Fund	5 637 586	5 239 444	92,9%
GoR (Recurrent budget)	2 907 520	3 024 824	104,0%
WHO	65 000	65 000	100,0%
Grand Total	**8 643 113**	**8 361 961**	**96,7%**

Table 27: Damian Foundation expenditures per budget category for the year ended 30 June 2021

Activities	Budget for FY 2020/21 in USD	Expenditures for FY 2020/21 in USD	Variances in USD	Performance in %
Conduct leprosy active case finding and contact examination by health center and social support to vulnerable group (Transfer to Health center)	11 777	11 777	0	100%
Pay salaries and PBF for RBC contractual staff on Foundation Damien	13 966	13 966	0	100%
Provide communication fees to RBC Staff	1 054	1 054	0	100%
Train Health care workers on leprosy management	1 596	1 596	0	100%
To provide mission on leprosy management for TB&ORD staff	4 541	4 227	314	93%
Bank charges	73	73	0	100%
Total	**33 007**	**32 693**	**314**	**99,05%**

As the table shows for FY 2020-2021, Damian Foundation is contributing to TB expenditures the total budget of USD 33 007 with TB Expenditures by budget activities of USD 32 693 representing 99,05 % of total budget planned for Fiscal year 2020-2021.

11.3. Government contribution to TB National Strategic Plan

The GoR funds are allocated to different health programs during the annual planning and budgeting process, which entails prioritization process by the Ministry, RBC and decentralized levels basing on HSSP III and different disease program strategic plans serve as guiding documents.
Apart from program specific financing, the estimation of GoR contribution takes into consideration all other health related programs costs, categorized as health systems strengthening costs in the MTEF Chapter of (i) Compensation of employees; (ii) Use of Goods & Services; (iii) Acquisition of fixed assets; (iv) Subsidies; (v) Grants; (vi) Social assistance and (vii) Other expenditures.

Table 28: GoR TB NSP budget and expenditure per MTEF chapter for the year ended 30 June 2021

MTEF Chapter	Budget for FY 2020/21 in USD	Expenditures for FY 2020/21 in USD	Variance in USD	Performance in %
21 Compensation of employees	1 286 905	1 248 992	37 913	97%
22 Use of goods and services	241 622	228 980	12 642	95%
23 Acquisition of fixed assets	294 175	289 031	5 144	98%
25 Subsides	17 107	17 107	0	100%
26 Grants	189 215	209 554	- 20 339	111%
27 Social assistance	322 495	299 598	22 898	93%
28 Other expenditures	556 001	731 563	- 175 562	132%
Total	**2 907 520**	**3 024 824**	**- 117 304**	**104%**

As the table shows for FY 2020-2021, the GoR is contributing to TB expenditures the total amount of USD 3 024 824 with TB Expenditures by MTEF budget category of USD 2 907 520 representing 104 % of total budget planned for Fiscal year 2020-2021.

11.4. The Global Fund contribution

For the Global Fund contribution, the budget for the year 2020–2021 was USD 5 637 586 . Out of this budget, a total of USD 5 239 444 have been effectively spent by the sub-recipients representing 92,9 % of total budget for TB NSF GF grant.

Table 29: GF TB NSP budget and expenditure per NSP cost category for the period of July 2020 to June 2021

GF COST CATEGORIES	Initial budget for FY 2020-2021 in USD	Revised budget for FY 2020-2021 in USD	Expenditures for FY 2020-2021 in USD	Variance in USD	Budget execution in %
1.0 Human Resources (HR)	895 701	823 262	784 441	38 821	95,3%
10.0 Communication Material and Publications (CMP)	15 697	20 655	20 655	0	100,0%
11.0 Indirect and Overhead Costs	1 530 656	1 598 137	1 597 769	368	100,0%
12.0 Living support to client/ target population (LSCTP)	245 286	245 286	160 389	84 898	65,4%
2.0 Travel related costs (TRC)	309 162	462 406	460 912	1 494	99,7%
4.0 Health Products - Pharmaceutical Products (HPPP)	222 189	426 385	426 385	- 0	100,0%
5.0 Health Products - Non-Pharmaceuticals (HPNP)	1 163 396	1 768 334	1 768 334	0	100,0%
7.0 Procurement and Supply-Chain Management costs (PSM)	156 514	156 514	20 559	135 955	13,1%
9.0 Non-health equipment (NHP)	1 098 984	136 606		136 606	0,0%
TOTAL	**5 637 586**	**5 637 586**	**5 239 444**	**398 142**	**92,9%**

The table above shows the TB NSP budget execution per NSP cost category for the period of July 2020 to June 2021 representing a total rate of 92,9%. The unspent budget of USD 398 142 for mainly activities like : purchase of digital CXR machines for DHs and X-ray for COVID 19 .

Table 30: GF TB NSP budget and expenditure per Budget agencies for the period of July 2020 to June 2021

Budget Agencies	Revised budget for FY 2020-2021 in USD	Expenditures for FY 2020-2021 in USD	Variance in USD	Budget execution in %
CHUB	60 720	60 500	220	100%
CHUK	75 120	74 848	272	100%
MOH	1 026 661	1 013 208	13 453	99%
NYC	44 273	40 812	3 461	92%
RBC	4 430 812	4 050 075	380 737	91%
Grand Total	**5 637 586**	**5 239 444**	**398 142**	**93%**

12. Conclusion, Way forward and Recommendation

During the FY 2020-2021, the TB&ORD Division with partners continued effort for fighting against TB and others respiratory diseases. Although the COVID-19 pandemic was still affecting the country and the rest of the world, Rwanda Ministry of Health through the National TB Program underwent TB screening, diagnostic, treatment, and prevention. A quick summary of findings and key achievements we may emphasize are found below:

- We observed an increase of TB presumptive cases, mainly patients referred by CHWs. However, the positivity rate decreased, and it may be due to early screening of tuberculosis and low uptake of molecular diagnostic test. The first-line DST coverage was not good among bacteriologically confirmed pulmonary TB cases nor the second DST coverage among RR-TB cases. Consequently, the total number of susceptible TB cases decreased, and the country registered an important reduction of RR-TB notification compared to the previous FY. The notification of childhood TB is still low compared to national TB program target.
- The treatment success rate for TB all forms for both susceptible and drug resistant tuberculosis reached the NSP target (2020-2021 FY). We observed an improvement of the treatment success rate in 25 DHs compared to the previous FY. The mortality rate is stagnant, but high in clinically diagnosed and TB-HIV coinfected patients. A high number of malnourished DS-TB patients was registered during this FY but the quantities of food supplements were not enough for their nutrition support.
- Almost all the TB prevention indicators are above the TB NSP 2019-2024 targets. However, the TPT coverage in under 5 years household contacts, has significantly decreased compared to the previous FY. The Tuberculosis preventive treatment in PLHIV is under scale up phase and we plan to extend it in all Hospitals.
- The civil registration and vital statistics were launched and death registration will be decentralized at cell level to improve registration completeness and availability of causes of death from both health facility and the community. The TB related deaths can be accessed in the DHIS2.
- Several activities aiming at reducing the leprosy burden towards the elimination in Rwanda have been implemented. Some key interventions done are: trainings, distribution of tools and electronic individual recording system for leprosy patient was developed. TB Program continues to avail leprosy medicines and it improved the treatment success for both PB and MB that reached 100%.

About 8 million US dollars have been used to achieve all the TB national targets. The mains contributors are: the Government of Rwanda, Global Fund for AIDS, TB and Malaria (GFATM), WHO and Damian Foundation.

The Ministry of Health through the National TB Program is advancing towards TB elimination as common Worldwide vision. With the support from our different partners, interventions in place for TB control shall continue and we may mention the active case finding among the HRGs. We already implemented the tuberculosis preventive treatment for PLHIV and it shall be extended in all District Hospitals. In addition, we plan to implement soon the treatment of the latent tuberculosis infection for the above 5 years old household contacts of confirmed TB patients.

Apart the above-mentioned key interventions, the digitalization of TB Program is progressing well, as currently having the electronic individual records (e-TB) in the DHS2 platform, where all TB related data may be easily captured and found. Additional features in this TB Program digitalization process to be customized are: the Video observed therapy (VOT) and medication adherence for TB patients, Data to Care and its interoperability within the electronic TB database, the artificial intelligence for X-ray reading and the civil registration and vital statistics with TB related deaths registration system. The TB Program digitalization shall help in the TB diagnostic and treatment adherence improvement, TB results turn round time, recording and reporting systems.

After the analysis made and having the TB features status, we recommend:

- ✓ To the Ministry of Health continuing the mobilization of funds for the TB control and prevention. The capacity building of the community health workers shall be focused on given their role in the early TB detection. We advocate as well that the Ministry of health shall continue to avail TB sensitive tools.
- ✓ To the National TB Program to maintain already achieved targets and double its efforts to improve TB service by:
    - enhancing the quality of TB screening, use of more sensitive TB diagnostic tools at decentralized level and
    - ensuring reliable and uninterrupted maintenance of the TB diagnostic plateforms/tools
    - ensuring a better supply chain for TB and leprosy commodities
    - strengthening the supervisions and mentorship on TB diagnosis and treatment follow up in the district with poor treatment outcome and/or significant reduction of treatment success rate
    - making deep analysis of available data to understand the reason for DR-TB reduction
    - reinforce the collaboration with medical associations for capacity building of health care providers at decentralized levels on TB management

TB&ORD Division should also advocate for additional funds to cover nutrition support for drug susceptible TB patients with malnutrition.

ANNEXES

Annex 1: TB Indicators in Monitoring and evaluation framework, Rwanda from July 2020 to June 2021.

GOALS for 2024 as compared to 2015:					
☐ 35% reduction of TB incidence rate ☐ 57% reduction of TB deaths ☐ Reduction of TB-affected families facing catastrophic costs due to TB (to be determined after the survey).					
	Indicator	**Purpose**	**Detail**	**2020/21 (Target)**	**2020/21 (Achievements)**
Goal	1. Percentage of reduction of TB Incidence rate (per 100,000 hab)	**Impact**	Measured by WHO estimations by modeling	23.3%	6.6%
Goal	2. Percentage of reduction of TB Deaths rate	**Impact**	Measured by WHO estimations by modeling	38.0%	9.6%
Goal	3. Percentage of TB-affected families facing catastrophic costs due to TB ***(End TB Top-ten indicator N°3)***	**Impact**	Numerator: Proportion of TB patients (and their households) who incur catastrophic costs Denominator: all patients treated	NA	NA
0	4. Proportion of first level health facilities that have at least one staff trained to provide PAL services	process	Numerator: Number of first level health facilities that have at least one staff trained on PAL approach Denominator: Total number first level health facilities	20%	66.9% (79/118)
1	5.TB notification rate new and relapses (per 100,000)	Outcome	Numerator: Number of TB cases notified (new and relapses) Denominator: Population/100,000	5419 42.3/100k	5,379 42.0/100 k

GOALS for 2024 as compared to 2015:					
☐ 35% reduction of TB incidence rate ☐ 57% reduction of TB deaths ☐ Reduction of TB-affected families facing catastrophic costs due to TB (to be determined after the survey).					
	6. TB treatment coverage ***(End TB Top-ten indicator N° 1)***	Outcome	Numerator: Number of new and relapses cases that were notified and treated Denominator: estimated number of incident cases in the same year (%)	88%	70.3% (5,294/7,500)
1.1.	7. Contact investigation coverage ***(End TB Top-Ten N°6)***	Coverage	Numerator: Number of contacts of bacteriologically confirmed TB cases who were investigated for TB Denominator: Number of contacts of bacteriologically confirmed TB cases	≥90%	99.5% (17,199/17,291)
1.1.	8. Proportion of TB cases notified among high-risk groups (HRGs (Number and Percentage)	Process	Numerator: Number of TB cases (~~new & relapses~~ all forms) notified in HRGs Denominator: Total number of TB cases notified during the period of assessment	≥53%	53.4% (2093/5435)
1.2.	9. Proportion of children 0-14 years notified among TB cases new and relapse	Output	Denominator: Total number of TB cases notified during the period of assessment Number of TB cases aged 0-14 (new & relapses) Denominator:	8.5%	6.4% (346/5435)

GOALS for 2024 as compared to 2015:					
☐ 35% reduction of TB incidence rate ☐ 57% reduction of TB deaths ☐ Reduction of TB-affected families facing catastrophic costs due to TB (to be determined after the survey).					
			Total number of TB cases notified (new and relapses)		
1.3.	10. Proportion of newly notified patients diagnosed using WHO recommended rapid tests ***(End TB Top-Ten N°4)***	Output	Numerator: Number of all newly notified TB patient diagnosed with WHO recommended rapid tests Denominator: All number of newly notified TB patients	S1:65%	72.9% 3649/5007

	11.a DST Coverage for TB patients ***(End TB Top-Ten indicator N° 7)***	Coverage	Numerator: Number of TB patients with a drug susceptibility result for at least Rifampicin (Xpert MTB/RIF or phenotypic DST) Denominator: Number of all notified cases in the same year. Disaggregation for New TPB+ and previously treated cases	75%	73.6% (3,998/5435)
	11.b Percentage of TB patients with DST results for at least Rifampicin among the total	Coverage	Numerator: All bacteriological confirmed TB cases (New and Retreatment) with	86%	89.1% (3661/4107)

GOALS for 2024 as compared to 2015:					
☐ 35% reduction of TB incidence rate ☐ 57% reduction of TB deaths ☐ Reduction of TB-affected families facing catastrophic costs due to TB (to be determined after the survey).					
	number of notified (New and Retreatment) cases in the same year.		DST (Xpert MTB/RIF or phenotypic DST) results for at least Rifampicin Denominator: All bacteriological confirmed TB cases (New and Retreatment)		
1.3.	12. Proportion of notified patients with rifampicin resistant (RR) or MDR who receive second line DST		Numerator: Number of TB notified patients with rifampicin resistant (RR) or MDR who receive second line DST (LPA or phenotypic DST) Denominator: Number of all notified patients with rifampicin resistant (RR) or MDR in the same year.	90%	58.8% (20/34)
1.4.	13.a. Proportion of health facilities diagnostic sites scoring pass in EQA for smear microscopy		Numerator: Laboratories sites scoring pass in EQA for smear microscopy (once per year) Denominator: Total number of laboratories with smear microscopy (number and percentage)	85%	79.1%

GOALS for 2024 as compared to 2015:					
☐ 35% reduction of TB incidence rate ☐ 57% reduction of TB deaths ☐ Reduction of TB-affected families facing catastrophic costs due to TB (to be determined after the survey).					
	13. b Proportion of health facilities Xpert sites scoring pass in EQA for Xpert MTB/RIF		Numerator: Laboratories sites scoring pass in EQA for Xpert MTB/RIF (once per year) Denominator: Total number of laboratories with Xpert MTB/RIF (number and percentage)	60%	59.4%
2	14. Treatment success rate (TSR) for all forms of TB cases (DS & DR-TB cases) ***(End TB Top-ten 2)***	Outcome	Numerator: TB cases (DS- and DR-TB cases) successfully treated (cured plus completed treatment) Denominator: total number of TB cases (DS- and DR-TB cases) registered during the year	S1≥ 86.5%	88.1% (5042/5721)
2.1.	15. Percentage of CDT with no stock out of FL tracers (RHZE and RH ad) drugs of experienced in the last 12 months	coverage	Numerator: Percentage of CDT with no stock out of First-Line TB tracer drugs (R150H75ZE&R150H75) Denominator Total number of CDT	98%	91.0% (183/201)

GOALS for 2024 as compared to 2015:					
☐ 35% reduction of TB incidence rate ☐ 57% reduction of TB deaths ☐ Reduction of TB-affected families facing catastrophic costs due to TB (to be determined after the survey).					
2.1.	16. Percentage of MDR TB centers with no stock out of SLD in the last 12 months	coverage	Numerator: Number of MDR TB centers with no stock out of SLD in the last 12 months Denominator Total number of MDR TB centers	100%	100% (2/2)
	17. Proportion of eligible PLHIV initiated on TPT	coverage	Numerator: Number of eligible PLHIV initiated on TPT Denominator Total number of eligible PLHIV	22%	25.6% (53,107/207,296)
2.3	18. Treatment success rate, confirmed RR/MDR-TB	Outcome	Numerator: Rifampicin resistant (RR)/MDR-TB cases successfully treated (cured plus completed treatment) Denominator: RR/MDR-TB cases enrolled on second-line anti-TB treatment (shorter regimen: patients enrolled in the previous 12 to 24 months; conventional regimen; patients enrolled in the previous 24 to 36 months)	86%	95.2% (59/62)

GOALS for 2024 as compared to 2015:					
☐ 35% reduction of TB incidence rate ☐ 57% reduction of TB deaths ☐ Reduction of TB-affected families facing catastrophic costs due to TB (to be determined after the survey).					
2.3	19. Treatment coverage new drugs ***(End TB Top-ten indicator N°8)***	Coverage	Numerator: Number of TB patients treated with regimens that include new TB drugs Denominator: Number of notified TB patients eligible for treatment with new drugs	90%	100% (16/16)
2.5.	20. Proportion of TB treatment cards where ADSM section is completed	Output	Numerator: Number of TB patients whose TB treatment card section on AE was completed adequately (every month for MDR-TB and for DS-TB); to reported at the end of TB treatment. Denominator: Total number of registered TB cases during the period of assessment; to reported at the end of TB treatment.	30%	99.9% (5,729/5,733)
2.5.	21. Proportion of diagnosed TB cases tested for HIV infection ***(End TB Top-ten indicator N°9)***	Output	Numerator: Number of TB patients who had an HIV test result recorded in the TB register Denominator: Total number of registered TB cases during the period of assessment.	≥95%	99.8% (5,423/5,435)

GOALS for 2024 as compared to 2015:					
☐ 35% reduction of TB incidence rate ☐ 57% reduction of TB deaths ☐ Reduction of TB-affected families facing catastrophic costs due to TB (to be determined after the survey).					
2.5.	22. Proportion of HIV positive TB cases given antiretroviral therapy during TB treatment	Output	Numerator: number of HIV-positive TB cases given antiretroviral therapy during TB treatment Denominator: number of HIV-positive TB cases registered during the evaluated period	93.5%	94.8% (1,083/1,143)
2.6.	23. Treatment success rate for TB patients (all forms) receiving DOT through community health workers (CHW)	Outcome	Numerator: TB patients receiving DOT by CHW who were successfully treated Denominator: all TB patients receiving DOT by CHW during the evaluated period	95.5%	93.3% (2,237/2,397)
3.1.	24. Percentage of Health providers screened for TB at least once during the year. (Health facility workers)	Coverage	Numerator: number of Health providers screened for TB at least once during the year. Denominator: number of health providers	78.5%	83% (21,691/26,037)
3.2	25.a LTBI treatment coverage among contacts < 5 years ***(End TB Top-ten indicator N°5)***	Coverage	Numerator: number of children who are contacts of TB cases started on LTBI treatment Denominator: number of children eligible for LTBI treatment	90%	91.4% (1,167/1,277)

GOALS for 2024 as compared to 2015:					
☐ 35% reduction of TB incidence rate ☐ 57% reduction of TB deaths ☐ Reduction of TB-affected families facing catastrophic costs due to TB (to be determined after the survey).					
	25.b LTBI treatment coverage among contacts > 5 years	Coverage	Numerator: number of people of > 5 years who are contacts of TB cases started on LTBI treatment Denominator: number of people of > 5 years eligible for LTBI treatment	NA	NA
1.6.	26. Percentage of population with adequate knowledge* on TB symptoms, transmission and prevention	Outcome	Numerator: Number of people with adequate knowledge* on TB symptoms, transmission and prevention Denominator: Number of people interviewed through the survey.	NA	NA
1.6.	27. Proportion of TB cases (all forms) referred by community health volunteers during the evaluated year.	Output	Numerator Number of TB cases (all forms) referred by CHW during the evaluated period Denominator: The total number of notified TB cases (all forms).	≥25%	26.3% (1,432/5,435)
4.1.	28. eTB coverage in CDT and CT proxy of Timeliness of routine reporting	Process	Numerator: Number of cases reported in eTB during the evaluated period by RSQA	96%	100%

GOALS for 2024 as compared to 2015:					
☐ 35% reduction of TB incidence rate ☐ 57% reduction of TB deaths ☐ Reduction of TB-affected families facing catastrophic costs due to TB (to be determined after the survey).					
			Denominator: Total Number of cases reported in all sources documents (eTB + and register) during the evaluated period by RSQA		
	29. Case fatality ratio (CFR) ***(End TB Top-ten indicator N° 10)***	Outcome	Numerator: Number of TB deaths (from VR system) Denominator: estimated number of incident cases in the same year	6.5%	NA
4.4	30. Number of standard criteria met using WHO TB standard and benchmarks checklist		Number of standard criteria met using WHO TB standard and benchmarks checklist	8	NA
4.5	31. Household health expenditure for TB			**tbd**	NA
4.6	32. Proportion of public health facilities where at least one staff has participated in training on TB		Numerator: Number of public health facilities where at least one staff has participated in training on TB Denominator: Number of public health facilities in Rwanda	38%	100% (573/573)
4.8	33. Percentage of people diagnosed with TB who report stigma in health care settings that inhibited them from seeking and accessing TB services		To be reported from the survey on stigma of TB patients	tbd	N/A

GOALS for 2024 as compared to 2015:					
☐ 35% reduction of TB incidence rate ☐ 57% reduction of TB deaths ☐ Reduction of TB-affected families facing catastrophic costs due to TB (to be determined after the survey).					
4.9	34. Percentage of people diagnosed with TB who report stigma in community settings that inhibited them from seeking and accessing TB services		To be reported from the survey on stigma of TB patients	tbd	NA

Annex 2: RBF achievement, from July 2020 to June 2021.

D. Modules and outcome/coverage indicators							
Module 1	**TB care and prevention**						
Coverage/Output indicator	**NSF Target (Jul 2020- June 2021)**			**Program Results (Jul 2020- June 2021)**			**Level of achievement**
	N# / **D#**	**%**	**Source**	**N#** / **D#**	**%**	**Source**	
TCP-Other 1: Case notification rate of all forms of TB per 100,000 population - bacteriologically confirmed plus clinically diagnosed, new and relapse cases		41.3	Grant agreement	5,379 / 12,809,443	42.0	Grant agreement	97.6%
TCP-2(M): Treatment success rate all forms: Percentage of TB cases, all forms, bacteriologically confirmed plus clinically diagnosed, successfully treated (cured plus treatment completed)		≥87%		4,989 / 5,659	88.2%	Grant agreement	100%
TCP-Other 3: Percentage of TB cases notified among high-risk groups		≥ 40%	Grant agreement	2,093 / 5,435	53.4%	Grant agreement	100%
TCP-Other 2: LTBI treatment coverage among contacts under 5		90%		1,167 / 1,277	91.4%	Grant agreement	100%
Module 2	**MDR-TB**						
				3,661	89.1%		100%

MDR TB-6: Percentage of TB patients with DST result for at least Rifampicin among the total number of notified (new and retreatment) cases in the same year		86%	N/A	4,107		Grant agreement	
MDR TB-other 1: Treatment success rate of RR TB and/or MDR-TB: Percentage of cases with RR TB and/or MDR-TB successfully treated.		≥ 87%	Grant agreement	59 62	95.2%	Grant agreement	100%
Module 3							
TB/HIV-6 (M): Percentage of HIV-positive new and relapse TB patients on ART during TB treatment		>90%	Grant agreement	1,083 1,143	94.8%	Grant agreement	100%

Annex 3: Leprosy Indicators in Monitoring and evaluation framework, Rwanda from July 2020 to June 2021.

	Indicator	Formula for calculation	Frequency	Importance	2020-2021 (Target)	2020 - 2021 (Achievement)
1	Number of children diagnosed with leprosy and visible deformities (G2D)	Number of children (0-14 years of age) with newly diagnosed leprosy presenting with G2D at diagnosis reported during the reporting year	Annually	Impact **indicator** Indicates quality of case detection, quality of leprosy care services and reflects awareness in the community.	0	0
2	Rate of newly diagnosed leprosy patients with visible deformities (G2D)	**Numerator**: Number of new cases detected with G2D x 1,000,000 **Denominator**: population of the reporting year	Annually	Impact indicator It reflects delay in diagnosis.	0,4 per million	0,23 per million (3*1000000/12809443)
3	Availability of web-based, case-based reporting system allowing disaggregation by age, sex, place of residence and other relevant criteria	Yes/No	Annually	Web-based reporting system leads to better quality of data, better data access, better programme management and better monitoring of trends	No	Yes
4	Percentage of endemic health facilities that have had at least 2 supervisory visits	**Numerator**: Number of endemic HF that have had at least 2 supervisory visits from district hospital x 100	Annually	It reflects district empowerment of leprosy control activities.	100%	50%

	from district hospital in the reporting year	**Denominator**: Number of endemic HF				
5	WHO certification of leprosy elimination in Rwanda (prevalence < 1 case per 10.000 habitants)		Once	Means that Leprosy has been eliminated as public health problem i.e. prevalence rate < 1/10 000 population.	NA	NA
6	New case-detection (number and rate per 100000)	**Numerator**: Number of new cases detected in the year x 100,000 **Denominator**: population of the reporting year	Annually	Outcome indicator. Relates to magnitude of leprosy burden and reflects case finding efforts. Under unchanged programme conditions, it is expected to remain stable or show decline between years. It should be interpreted along with other indicators of quality of case finding such as proportions of MB, G2D and children among new cases.	29 (0,23)	14 0,11 (14*100000/12809443)

7	Leprosy prevalence rate per 10000.	**Numerator**: Number of leprosy cases on register at the end of the reporting year x 10,000 **Denominator**: population of the reporting year	Annually	Outcome **indictor.** It reflects the capacity of the programme to detect and manage cases until the end of treatment. It has been used to define the target of elimination as public health problem i.e. prevalence rate < 1/10 000. It refers to actual number of people who are in need of MDT (registered for treatment) at a point in time).	0,017	0,011 (14*10000/12809443)
8	Proportion of G2D cases among total new cases detected.	**Numerator**: Number of new cases detected with G2D x 100 **Denominator**: Total number of new cases detected in the reporting period	Quarterly and annually	Outcome indictor. It reflects delay in diagnosis. Generally figures above 5% are considered to reflect delayed case detection.	≤ 16%	21,4 % (3/14)

9	Proportion of child cases among total new cases detected.	**Numerator**: Number of new child cases detected x 100 **Denominator**: Total number of new cases detected in the reporting period	Quarterly and **annually**	Outcome indictor**:** It reflects transmission of leprosy. It also indicates the capacity of the programme to identify the disease among children. It is also used to calculate MDT requirement for children. It should be interpreted in conjunction with MB and G2D proportion. Desired is a reduction in trends aiming at 0% indicating zero leprosy transmission.	7%	0%
10	Proportion of MB cases among total new cases detected.	**Numerator**: Number of new MB leprosy cases x 100 **Denominator**: Total number of new cases detected in the reporting period	Quarterly and **annually**	Outcome indicator**:** It reflects quality of case detection since a higher proportion of MB cases among the new reflects delay in diagnosis leading to higher transmission. In low endemic countries the last few cases detected will all be MB since they	45%	64% (9/14)

				tend to have a longer incubation period.		
11	Proportion of female cases among total new cases detected.	**Numerator**: Number of new female leprosy cases detected x 100 **Denominator:** Total number of new cases detected in the reporting period	Quarterly and annually	Outcome indicator. It may reflect differential access to health care and also possible physiological differences in susceptibility to disease.	< 45%	57% (8/14)
12	Proportion of contacts screened.	**Numerator**: Number of contacts screened for leprosy **Denominator**: Total number of contacts registered in the reporting year	Quarterly **and** annually	Output **indicator**. It indicates the intensity of efforts at case detection and therefore quality of case detection.	0.75	45/72= 62,5%
13	Proportion of foreign-born among total new cases detected	**Numerator**: Number of foreign-born new cases detected (resident in Rwanda for less than 15 years at the time of diagnosis) x 100 **Denominator:** Total	Quarterly and annually	Within decreased local transmission and reducing burden, cases of leprosy attributable to patients coming from countries with high endemicity are expected	NA	0

		number of new cases detected in the reporting period		to rise over time. Increasing trend is therefore expected.		
14	MDT completion for new PB	**<u>Numerator</u>**: Number of new PB patients who have completed treatment timely* x100 **<u>Denominator</u>**: Number of new PB patients registered in the reporting period, 1 year before	Quarterly and annually	Outcome indicator. MDT completion rates for new PB and MB patients are the most important indicators informing on quality of case holding. Every patient that is given MDT should complete the treatment on time*. Incomplete treatment may have adverse consequence to the patients and sustain transmission in the community.	>95%	100%
15	MDT completion for new MB	**<u>Numerator</u>**: Number of new MB patients who have completed treatment timely* x100 **<u>Denominator</u>**: Number of new MB patients registered in the	Quarterly and *annually*	*PB: *6 blisters within 9 months MB: 12 blisters within 18 months maximum*	>95%	100%

		reporting period, 2 years before.				
16	Proportion of new PB patients assessed for disability status at least both at beginning and at end of treatment	**Numerator**: Number of new PB cases assessed for disability at the time of diagnosis and at the time of treatment completion x 100 **Denominator**: Number of new PB cases having completed treatment ***(numerator of indicator 13)***	Quarterly and annually	Output indicator. It is important to ensure that all new cases are adequately followed during treatment. It reflects quality of case holding meaning patient management.	> 85%	
17	Proportion of new MB patients assessed for disability status at least both at beginning and at end of treatment	**Numerator**: Number of new MB cases assessed for disability at the time of diagnosis and at the time of treatment completion x 100 **Denominator**: Number of new MB cases having completed treatment ***(numerator of indicator 14)***	Quarterly and annually	Output indicator. It is important to ensure that all new cases are adequately followed during treatment. It reflects quality of case holding meaning patient management.	> 85%	100%

18	Number and proportion of new PB patients who have developed new disabilities during the course of treatment	**Numerator**: Number of new PB cases who have developed new disabilities during the course of treatment (= increase of the total disability score for both eyes, both hands and feet) x 100 **Denominator**: Number of new PB cases having completed treatment ***(numerator of indicator 13)***	Quarterly and annually	Outcome indicator reflecting the quality of care (case holding) provided to patients during MDT treatment. High proportion could mean lack of follow-up of patients and inadequate management of reactions. There should be at least two assessments for all cases – one at the time of diagnosis and the other at the end of treatment for this indicator to be calculated. This indicator needs to be looked at in conjunction with treatment completion.	≤ 1 case	0 case
					≤5%	0%
19	Number and proportion of new MB patients who have developed new disabilities during	**Numerator**: Number of new MB cases who have developed new disabilities during the course of treatment (= increase of the total	Quarterly and annually	-	≤ 2 cases	0 case
					≤10%	0

	the course of treatment	disability score for both eyes, both hands and feet) x 100 **Denominator**: Number of new MB cases having completed treatment ***(numerator of indicator 14)***				
20	Number of cases treated (new and retreatment) having developed leprosy reactions during treatment	Number of cases treated (new and retreatment) having developed leprosy reactions during treatment	Quarterly and annually	Output indicator. It reflects quality in patient records and proper identification of a reaction. Reaction is an emergency. If not managed adequately, the patient may develop a disability. It is also useful to calculate the requirement of steroids.	≤ 4 cases	0 case
21	Number and proportion of retreatment cases over the total leprosy cases notified	**Numerator**: Number of retreatment cases (retreatment after loss to follow-up and relapses) x 100 **Denominator**: total leprosy cases notified in the reporting period	Quarterly and annually	Outcome indicator. The proportion of retreatment is usually small. Should show a stable or decreasing trend. It reflects the quality of case holding.	≤ 12%	0 case 0%

22	Existence of an association of patients affected by leprosy in the endemic sectors	**Numerator**: Number of endemic sites with an association of patients affected by leprosy **Denominator**: Number of endemic sites	Annually	It reflects participation of persons affected by leprosy and effort for socioeconomic reintegration of patients.	2/8	2/8

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